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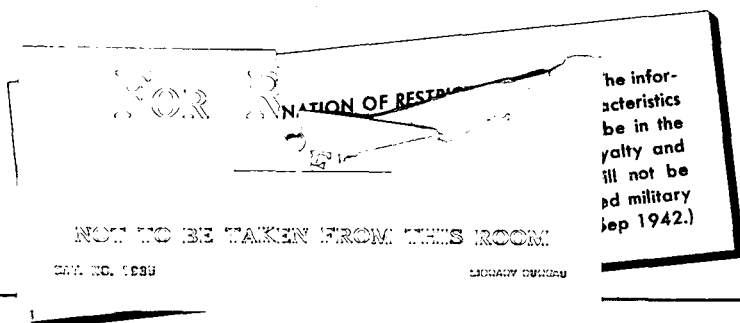
FM 5-20C

WAR DEPARTMENT FIELD MANUAL ^{copy 1}

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CORPS OF ENGINEERS

CAMOUFLAGE OF BIVOUACS, COMMAND POSTS, SUPPLY POINTS, AND MEDICAL INSTALLATIONS



WAR DEPARTMENT

MAY 1944

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CORPS OF ENGINEERS

CAMOUFLAGE OF BIVOUACS,
COMMAND POSTS, SUPPLY
POINTS, AND MEDICAL
INSTALLATIONS



WAR DEPARTMENT

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MAY 1944

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FM 5-20C, Corps of Engineers Field Manual, Camouflage of Bivouacs, Command Posts, Supply Points, and Medical Installations, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
*Major General,
The Adjutant General.*

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(For explanation of symbols, see FM 21-6.)

C O N T E N T S

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C H E C K L I S T

CAMOUFLAGE OF BIVOUACS

QUARTERING PARTY

1. Study aerial photographs and large-scale maps of area to be occupied. Make one or more tentative camouflage plans designed to take advantage of dark and heavily textured parts of the ground pattern.
2. Make ground reconnaissance of area.
3. Make final comprehensive camouflage plan. If necessary, draw diagram of plan on map overlay. Make use of overhead cover, clumps of bushes, scrub growth, folds or other shadow-casting irregularities in the ground surface. Plan should include:
 - a. Adequate dispersion.
 - b. Areas for:
 - (1) Unit tentage.
 - (2) Facilities.
 - (3) Vehicle and equipment parking.
 - (4) Parking for visiting vehicles.
 - (5) Security elements.
 - (6) Cutting natural materials.
 - (7) Disposal of spoil.
 - c. Track plan, which:
 - (1) Makes use of existing foot paths and vehicle tracks.
 - (2) Keeps new foot paths and vehicle tracks to a minimum and conceals them by siting them under overhead cover or close to and along natural lines in the terrain pattern.
 - (3) Provides a concealed entrance and exit to area.
 - (4) Provides one-way traffic circulation.
4. Make camouflage plan effective by:
 - a. Posting traffic signs. Reflectors and lighted signs for night traffic should have natural or artificial overhead screening.
 - b. Taping or wiring-in exposed sections of foot paths and vehicle tracks.
 - c. Posting traffic guides to prevent short cuts and other violations of camouflage discipline.
 - d. Erecting overhead or oblique screening where necessary.
 - e. Improve soft and soggy sections of the roadbed to prevent it from becoming noticeably rutted or widened.

UNIT COMMANDERS

1. Make sure all personnel understand details of camouflage plan.
2. Designate off-limits areas. These include all open ground and bare spaces in woods extending 10 paces inside from the edge of woods. The 10-pace limit is especially important with green troops.
3. Make a camouflage inspection soon after arrival in area and periodic inspections throughout stay. Standing operating procedure should include:

- a.* Immediate concealment of parked vehicles and equipment, as far as conditions permit.
- b.* No fire at enemy planes unless otherwise ordered.
- c.* Dispersion to be observed at all times. No congregations of personnel or equipment.
- d.* No laundry hung out to dry except at specified times and in specified spots which are safely covered.
- e.* Empty cans to be buried and all shiny articles to be kept under cover.
- f.* No shelter tents to be pitched by day, except under heavy cover or in rain or fog, and no latrine screens erected unless otherwise ordered.
- g.* Latrines to be placed under cover. Paths to latrines to be well marked and concealed.
- h.* Spoil from kitchen-refuse pits, latrines, and foxholes to be concealed.
- i.* Natural and artificial camouflage to be maintained at all times.

CAMOUFLAGE OF COMMAND POSTS

QUARTERING PARTY

All items on check list for bivouacs apply to command posts, with the following additions:

- 1. Any expected increase in amount of traffic, personnel, and materiel must be provided for in the original camouflage plan.
- 2. Isolated buildings must be avoided.
- 3. Site must be capable of being occupied for extended periods without being disclosed by changes in surroundings.
- 4. Locate command post to take advantage of existing roads, telephone and telegraph lines.
- 5. Vehicles must be parked several hundred yards from command post.
- 6. Locate new communication lines under natural cover, along terrain lines, or both.
- 7. Conceal security-weapons emplacements and tracks to them.
- 8. Locate protective wire along terrain lines or where an ordinary fence might logically be placed.
- 9. When the enemy knows a command post must be in the vicinity, arrange for a decoy command post.

UNIT COMMANDER

Perform same functions as noted in check list for bivouacs.

CAMOUFLAGE OF SUPPLY POINTS

Check lists for bivouacs and command posts also apply to supply points, with the following additions:

- 1. Disperse materiel but stay within the limit of practicable concealment. That is, do not disperse so much that it will draw attention or make camouflage impossible.

2. Establish waiting areas for vehicles at some distance from loading or unloading points.
3. Utilize all existing terrain features—ruins, trenches, craters, etc.—for storage of supplies.
4. Utilize all existing natural overhead cover consistent with ease of access and operations.
5. Stack supplies to resemble the shape of the terrain feature in which they are placed.
6. Construct decoy supply points when it is desired to mislead the enemy, but only on authority of the force commander.

WATER POINTS

7. Provide good drainage for spilled water.
8. Establish and maintain rigid schedule for vehicle loading.

CAMOUFLAGE OF MEDICAL INSTALLATIONS IN A DIVISION AREA

All items on check list for bivouacs apply to medical installations in a division area, with the following additions:

1. Avoid sites near landmarks.
2. Construct any required camouflage quickly to avoid delay in use of the installation.
3. Litter bearers must use concealed routes whenever possible.
4. Preliminary examination rooms should be light-tight.
5. Tone down metal chests, pails, and shiny objects with dull paint.
6. Ambulances must stop under cover.
7. Park vehicles in concealed areas to rear of installation.
8. Bury empty bottles and other empty shiny containers.

COLLECTING STATIONS

9. Must have sheltered place for vehicles to load, unload, and turn.
10. Turn-off roads from main roads to station must be concealed or carried past the station.

CLEARING STATIONS

11. Locate in large civilian buildings when possible. Permanent cover preferable to tents.
12. When tents are required, erect minimum number needed, and only under overhead concealment.
13. Color tents to match surroundings.

MEDICAL VEHICLES

14. Keep dispersed always.
15. Cover with drapes when parked.
16. When red cross insignia is ordered covered, do not paint it out—cover it with tarpaulin or other OD-colored material.

CAMOUFLAGE

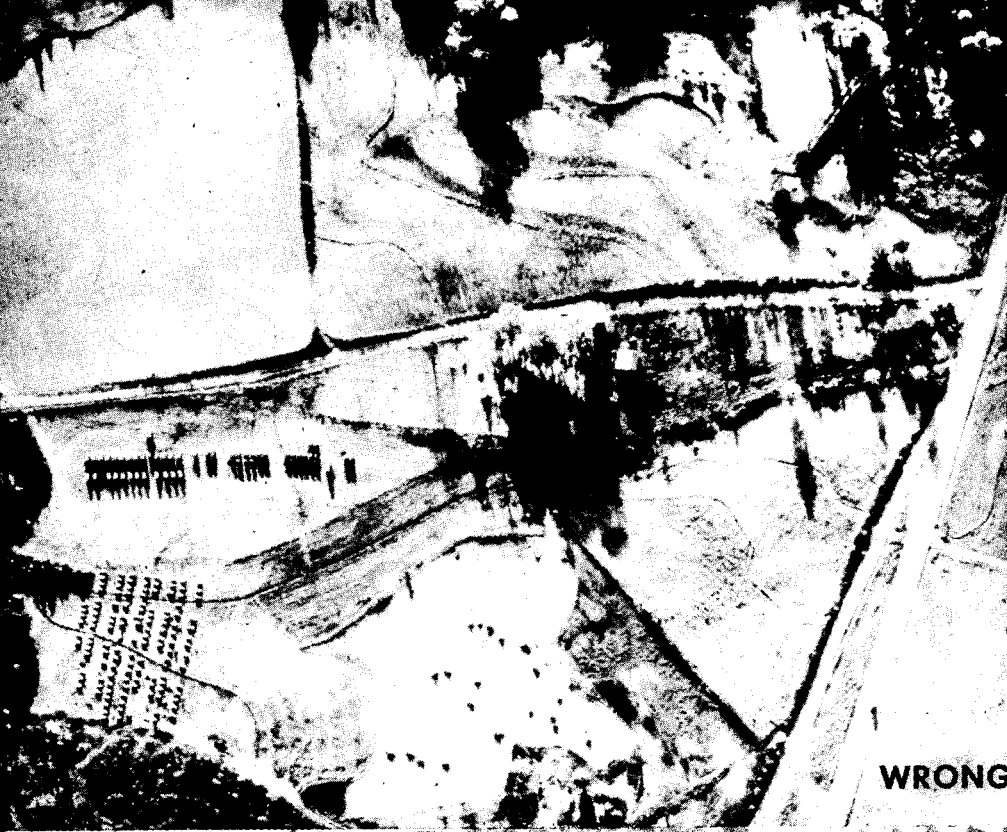
OF

BIVOUACS, COMMAND POSTS, SUPPLY POINTS, AND MEDICAL INSTALLATIONS

INTRODUCTION

This manual deals with the camouflage of bivouacs, command posts, supply points, and medical installations.

Although these installations are treated in separate sections, their camouflage problems are much alike. Each is an activity in which personnel and equipment are closely grouped in one area for more than a few hours. This manual aims to make clear the camouflage problems involved and the ways to solve these problems.



WRONG



RIGHT

Part I

CAMOUFLAGE OF BIVOUACS

Part I discusses the means and methods of camouflaging bivouacs to conceal them from enemy observation.

A unit in bivouac is particularly vulnerable to enemy aerial observation and attack because its elements are concentrated in a smaller area than usual; and, except for security elements, its men are resting and are less alert than on the field of battle. For these conditions, camouflage must be at its best. The unit not only must conceal itself quickly and efficiently but must avoid the danger of breaches in camouflage discipline, which are most apt to occur wherever any army unit occupies an area for more than a short time.

VITAL ELEMENTS OF CAMOUFLAGE

As in most military operations conducted swiftly and in forward areas, the two most important elements of camouflage for bivouacs are siting and the standing operating procedure (SOP). Siting is the selection of terrain and the judicious placing of a unit or activity therein. The SOP must be based on an understanding of camouflage discipline by all ranks.

Clearly, in an operation of this nature, the individual soldier is extremely important. One man's error can nullify the effects of months of training, the most intelligent planning, and the most careful behavior by the rest of the unit. A single

FIGURE 1 ① and ②.—The regular alignment of tents and vehicles, as in the upper picture, presents an easily located and extremely vulnerable target to the enemy; it is a stupid practice in the presence of the enemy. Instead, every effort must be made to get the most out of concealment factors of the terrain. Even in terrain like this, partial concealment in bivouac is possible. The drawing below is a lesson in concealment by siting. This area lacks wooded terrain, but has many lines made by furrows, hedgerows, roads, and ditches. Therefore, most vehicles are parked alongside the hedgerows and near the roads, making use of the camouflage principle that an object placed parallel to and on or near a strong terrain line seems to become a part of that line. Tents are dispersed irregularly underneath trees. Headquarters moves into existing farm buildings. Communication lines are excellent. The unit becomes inconspicuous merely by taking care to preserve the normal appearance of the countryside.

mess kit flashing at the wrong moment betrays an innocent-looking area to the enemy, draws his closer inspection, and results in disclosure and action against the position.

DEVELOPMENT OF THE BIVOUAC

There are at least four critical stages in the development of a bivouac. Listed in the order in which they occur, they are:

- | | |
|-----------------------------|------------------------------|
| <i>a. Planning Stage.</i> | <i>c. Maintenance Stage.</i> |
| <i>b. Occupation Stage.</i> | <i>d. Evacuation Stage.</i> |

PLANNING STAGE.—Frequent bivouacs are characteristic of mobile warfare. In such warfare, there is seldom time or facilities to erect elaborate constructions for concealment. Bivouacs are hasty—quickly entered and quickly departed from. Camouflage measures are swift, rough, and dependent upon local materials. But no matter how swift the operation or how limited time and facilities, the commander of a unit—always aware of his responsibility for the camouflage of his organization—must plan for concealment in bivouac.

a. Reconnaissance and choice of position.—The general area of the bivouac is determined by the tactical plan. Before going into this general area, the quartering party should become as familiar as possible with the terrain and the ground pattern through a careful study of maps and aerial photographs. The quartering party should be fully acquainted with both the tactical plan and the demands of camouflage and should be equipped to indicate dispersal points and concealment areas for all equipment, to tape paths, roads, and areas for trenches and foxholes, and to post traffic regulations.

The things which the quartering party keeps in mind are:

(1) Mission of the unit. The tactical plan and its demands, which normally include concealment of the bivouac, must be satisfied as completely as possible.

(2) Access routes. Effectiveness of concealment depends greatly on a well-prepared and well-maintained track plan.

(3) Existing concealment qualities of the area.

(4) Size of the area in relation to the unit which will occupy it. Dispersion helps take advantage of natural concealment; the area must be big enough to allow for it.

(5) Concealment of the all-around defense element of the position. Even though other elements of a bivouac are well concealed, a conspicuous all-around defense may betray it.

b. Siting.—Siting is the key to the whole problem. Good siting solves at least 75 percent of the concealment problem.

A good bivouac area, for example, would be one in a large wooded area containing many existing routes of approach; but such an ideal place is seldom found—nor is it necessary. Shadows, terrain lines, rocky areas, villages, farms, even deserts can absorb a military unit into the terrain. A commander must be ready to fit his organization into *any* kind of landscape and make it inconspicuous. The succeeding pages show some of the ways in which this is done.

c. **Preparation and dissemination of orders.**—The camouflage plan must consider the march plan of the organization. Orders include some description of the camouflage plan and the important points of camouflage discipline pertinent to the area. For example, a particular warning may be necessary to avoid a newly plowed field bordering one edge of the bivouac area.

OCCUPATION STAGE.—A carefully controlled traffic plan must be rigidly adhered to while the units move into position. Guides posted at route junctions should be fully informed as to the camouflage plan. One of their duties is to enforce camouflage discipline. Turn-ins must be wired in clearly to prevent widening of corners by vehicles. Foot troops must follow wired paths through the area. This is a critical stage in the bivouac. Bad discipline at this time can nullify any further effort at concealment.

a. **Dispersion.**—There must be no congestion of vehicles or installations. Dispersion is one of the best methods of preventing losses in the event of discovery of the position and consequent aerial or artillery attack. Dispersion should be automatic. Vehicles will seldom be less than 30 yards apart in ordinary terrain or less than 100 yards in desert terrain.

The kitchen area should be carefully selected to provide for adequate dispersion of the various parts of the kitchen. The three main congested areas must be dispersed—the food-dispensing area, mess-kit washing area, and eating area.

b. **Immediate camouflage measures.**—Camouflage is not something applied as an afterthought to other activities. Camouflage measures must be immediate and continuous. If tracks have been made which can be seen from the air, immediate steps must be taken to obliterate them, if that is possible. However, it is an extremely difficult procedure which can only rarely be counted on to be wholly successful. If leaves or brush are handy, they should be strewn over tracks almost as soon as a truck has moved into its position. In sandy

areas, sand should be raked over ruts. Branches should cover tracked areas if these areas are small enough. Vehicles and other equipment should be concealed with natural materials or draped with nets as soon as they are in position. Spoil from foxholes, dug at once, is concealed.

c. **Tracks.**—When it is impossible to stay on existing routes and paths, three courses are open to the unit.

(1) Make new paths and tracks along existing natural lines, such as edges of woods, fence lines, hedgerows, irrigation ditches, terraces, and wire communication lines. New tracks adjacent to and paralleling such lines are far less conspicuous than fresh tracks breaking a "clean" area.

(2) If a new path in an open area must be made, it must be extended beyond its destination to a natural termination, such as a junction with a road. This false section must appear as well traveled as the true section. A new route must enter concealment some distance from its destination. Turn-arounds are avoided. Traffic-control plans which include a one-way system of travel must be strictly enforced.

(3) With little effort, some tree tops can be pulled and wired together to cover exposed areas. A more elaborate and difficult procedure—possible only in somewhat prolonged bivouacs—is the construction of overhead screens to conceal small sections of newly created paths and roads. This is a time-consuming operation and should be considered only as a last resort in such temporary operations as bivouacs.

MAINTENANCE STAGE.—Next to the occupation stage, the maintenance stage is the most critical. If the occupation stage has been successful from a camouflage standpoint, the maintenance stage is relatively easier. A successful occupation stage means that the unit has been aware of the camouflage problem and has observed camouflage discipline. Successful maintenance involves frequent inspection of installations, active patrol measures for camouflage discipline, and, if possible, aerial observation and photographs.

a. **Kitchen areas.**—Critical activities of a unit in bivouac are those which call for the congregation of troops. A most important activity of this nature is messing. Here, the track plan must be rigidly enforced.

Often artificial overhead cover—flat-tops or drapes—may be necessary to conceal kitchen areas. These must be constantly maintained. Garbage disposal pits must be carefully concealed, especially the spoil which is dug from them. In

the kitchen itself—if cooking stoves other than issue gasoline burners are used—the problem of eliminating smoke should be met by constructing a baffle above the stoves so that the smoke is well dispersed. The baffle itself should be camouflaged and concealed from aerial view.

b. **Night discipline.**—Night discipline is another difficulty. Men tend to relax in camouflage discipline at night, lulled into a dangerous feeling of being protected from observation by darkness. However, because aerial photographs taken at night will often reveal a unit whose discipline has become relaxed, the same standard of camouflage discipline must be observed by night as by day. Night photographs are surprisingly revealing. Wired and taped paths must be followed and blackout control must be enforced. No light should be allowed except under adequate concealment. No cooking is to be done at night over open fires, nor any laundry put out to dry where it will be revealed by aircraft photo flares.

c. **Bivouacs in open terrain.**—Concealment in terrain which lacks natural overhead cover, such as open fields, deserts, or the outskirts of villages, depends mainly on careful siting and wide dispersion. Shelter tents should be pitched along lines which are normal in the terrain pattern, such as fence and hedge lines or beside folds in the ground or other shadow-casting irregularities in the ground surface. Disruptive patterns, made with paint, mud, or native grasses, should be applied to tents. If time permits, tents and essential equipment should be at least partially dug in and spoil heaped around them in such a way that their shadows are minimized. Spoil lightens in color as it dries out and must be toned down with natural materials. During the daytime, tents are struck and concealed with natural materials.

EVACUATION STAGE.—Camouflage measures of a bivouac are not at an end when the unit moves out. An evacuated area can be left in such a mess that aerial photographs by the enemy will reveal the strength of the unit which occupied it, the kind of equipment carried, and the direction in which it went. It is part of camouflage discipline to leave the area looking undisturbed.

False bivouacs may sometime be used as part of a tactical plan of operational camouflage. For example, if it is known that the enemy has discovered a real bivouac, decoys simulate occupation after the unit moves out. Such operational camouflage is carried out only on orders of the force commander.

FIGURE 2.—This is an occupied bivouac area from 2,000 feet. The enemy pilot would suspect nothing.



FIGURE 3.—Natural materials correctly applied to shelter tent.



FIGURE 4.—Blanket conceals tent opening. Large tree helps distort tent shadow.

FIGURE 5.—Disruptive patterns assist blending. They are applied with paint, mud, soot, or dyes.

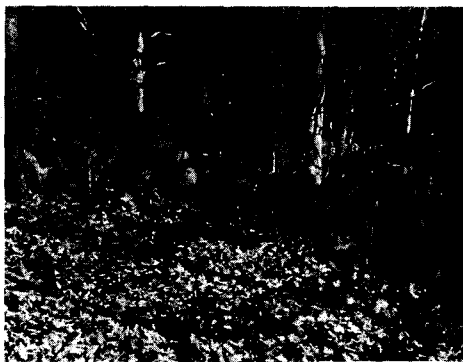




FIGURE 6.—Over-all shadow of this toned-down mess truck is broken up by cut foliage.



FIGURE 7.—Truck parked under tree. Note care with which reflecting surfaces have been covered.

CAMOUFLAGE PRACTICE IN BIVOUACS

The time is March. The bivouac area—shown here (fig. 2) from an altitude of 2,000 feet—is in a wood, with most leaves gone from the trees. It does not look promising to a bivouac-hunting party. The open area between the trees, the sparse leaves, the bare trees—all make it appear an inadequate place for a bivouac. But a unit of some 60 men and 15 vehicles is camped here. The accompanying pictures (figs. 3 through 8) show how the various elements are concealed, using local materials.

Tracks do not show. Where they are not broken up by tree shadows, they have been quickly erased by brushing leaves over them. The bivouac borders on two routes.

FIGURE 8.—View of vehicles made to blend with background.



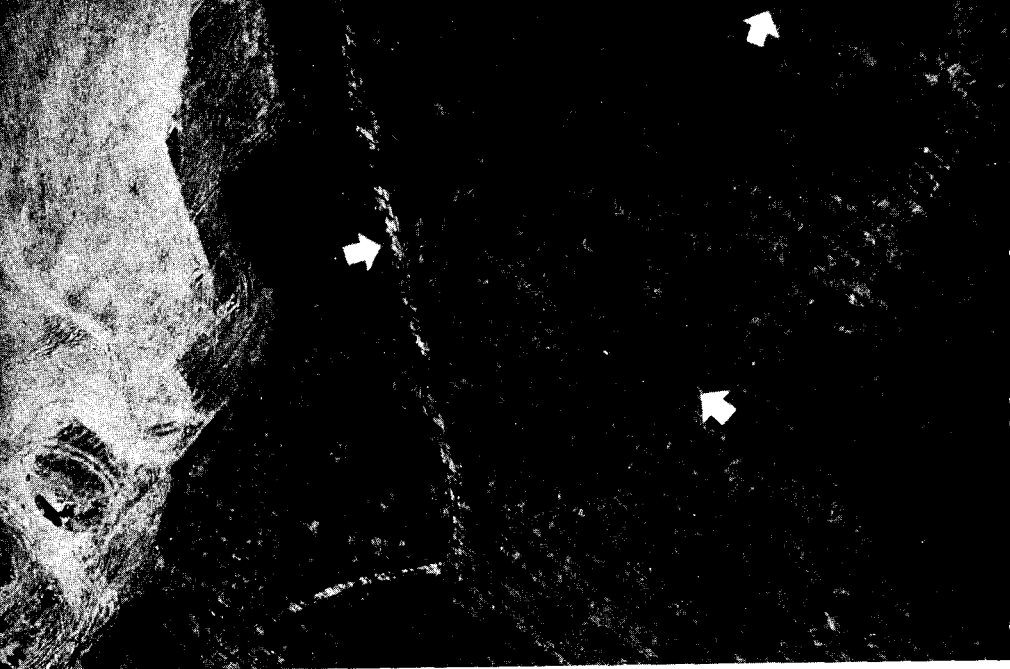


FIGURE 9.—Aerial view of a bivouac area from 2,000 feet. Arrows point to roads bounding the area, which provide excellent communication lines.

FIGURE 10.—Wire frames strung among large trees support canopy of natural foliage over truck.

In figure 9, within the triangle of roads, 15 vehicles are concealed. The site, season, and type of vegetation are similar to the terrain illustrated on the two preceding pages, except that here evergreens are mixed with deciduous trees. Concealment in this case, however, is achieved by the use of more artificial materials.

Quickly erected garnished nets are installed over the vehicles. A quickly erected modified drape is also used. Skeleton wire frames are stretched from the trees and the net draped over them.

FIGURE 11.—Garnished drape supported by trees conceals truck.



FIGURE 12.—Supporting wires strung to nearby trees assist in giving irregular form to garnished drape.



FIGURE 13.—Garnished drape need not be tight in this case. Overhead cover casts enough shadow to insure good blending.



①



②



FIGURE 14 ① and ②.—
Scale 1:6,000. Aerial view
with drawing illustrating
bivouac of tank destroyer
unit in terrain with sparse
vegetation. Eleven vehicles
are concealed here, indi-
cated in the drawing below.



FIGURE 15.—M6 tank destroyer
camouflaged with 30- by 30-ft.
drap and natural materials (No.
10 in fig. 14 ②).

Figure 14 illustrates the effectiveness of proper use of camouflage principles in bivouac. Note how the new access route up the left-hand side of the area follows the line of trees. The route is almost invisible; it certainly is inconspicuous.

To increase dispersion, the unit moved some of its vehicles into the clump of trees on the right, requiring a new access route to be made. This was done, correctly, by passing the route through the area and past it to a natural termination, another road.

Care has been taken to avoid scarring the plowed areas surrounding the bivouac.

Figures 15, 16, and 17 are ground views of three of the vehicles concealed in this area. Note how much natural materials have been depended on and how effective the result is from the air. In some cases, garnished twine nets, used as drapes, have supplemented the natural materials.

FIGURE 16.—M6 tank destroyer
concealed with natural materials
(No. 11 in fig. 14 ②).



FIGURE 17.—M10 tank destroyer
concealed with natural materials
(No. 3 in fig. 14 ②).



FIGURE 18 ①.— Scale 1:6,000. Bivouac in desert with scrub growth. When terrain is marked with numerous natural lines and with scattered, heavily shadowed vegetation, a successful bivouac can always be made. Access routes which parallel the terrain lines are lost to the aerial observer. Scattered vegetation offers refuge for tents and vehicles. Only such straight lines as the forked route in lower right of photograph stand out in such terrain. Note that no visible new trails lead off from it to the bivouac area. Figure 18 ④ is a drawing showing location of objects in this area. Figures 18 ②, 18 ③, 18 ⑤, and 18 ⑥ are ground views.

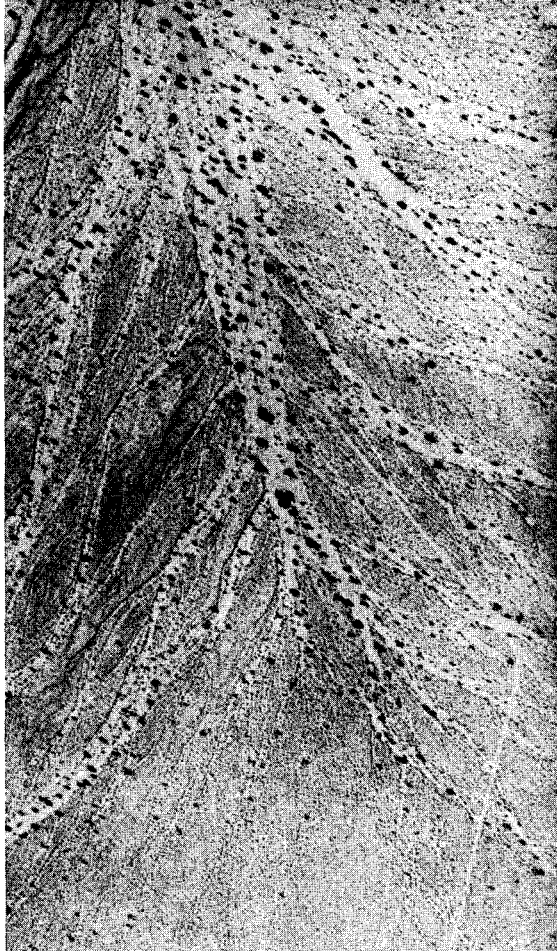


FIGURE 18 ②.—Two-and-one-half ton truck draped with 36- by 44-foot net (No. 1 in fig. 18 ④). Tree helps break up shape.



FIGURE 18 ③.—Light tank camouflaged with shrimp-net drape (No. 19 in fig. 18 ④). Props are used to support drape.



FIGURE 18 ④.—Drawing showing objects in figure 18 ①. Nos. 1, 2, 7, 8, 11, 15, 16, and 17 are 2½-ton trucks with shrimp-net drapes. Nos. 3, 4, and 10 are half-tracks with shrimp-net drapes. Nos. 6, 12, and 13 are half-tracks with natural materials. No. 14 is a half-track with a garished twine-net drape. Nos. 18 and 19 are light tanks with shrimp-net drapes. Nos. 20, 21, and 22 are light tanks with garished twine-net drapes. No. 5 is an uncamouflaged tent. No. 9 is an uncamouflaged kitchen area.

FIGURE 18 ⑤.—Light tank camouflaged with shrimp-net drape and sited beside tree (No. 18 in fig. 18 ④).



FIGURE 18 ⑥.—Light tank camouflaged with garished twine-net drape tied into tree (No. 21 in fig. 18 ④).





FIGURE 19.—Bivouac in scarred grassy area in a theater of operations. Tents are dug in as much as possible, painted in disruptive patterns, dispersed, and made to look like hummocks. Tufts of vegetation have been transplanted in the area to give texture to it.

Experience in the desert has taught our army much about concealment in areas where large, convenient trees are seldom found. Such areas, comparable to the desert, as far as camouflage is concerned, are unplowed fields, rocky areas, grasslands, and other open spaces of like nature. The desert has taught that concealment in such areas is not impossible. Certain kinds of predominantly flat terrain have shadows, made by folds in the ground, deep enough to allow some concealment by siting. Judicious use of nets can accomplish much in rendering objects inconspicuous.

Figure 20 is a ground view of objects situated in difficult terrain. Bare, except for short grass, this terrain offers few advantages to careful siting. However, the identity of these objects is hidden by keeping each installation as low to the ground as possible, by draping so as to break up characteristic form and so as to give them gently sloping sides.

Even in essentially barren terrain (fig. 21) excellent concealment is possible when the configuration of the ground is irregular enough to produce a strong shadow pattern. Note how difficult it is to find objects in figure 21.



FIGURE 20.—Vehicles in barren terrain. Drapes made of garnished twine nets transform these rectangular shapes into mounds.

FIGURE 21.—Rocky, barren terrain shown in oblique. Heavy shadows make even uncamouflaged equipment difficult to find. Note truck at 1, stacked supplies 2, tents 3.

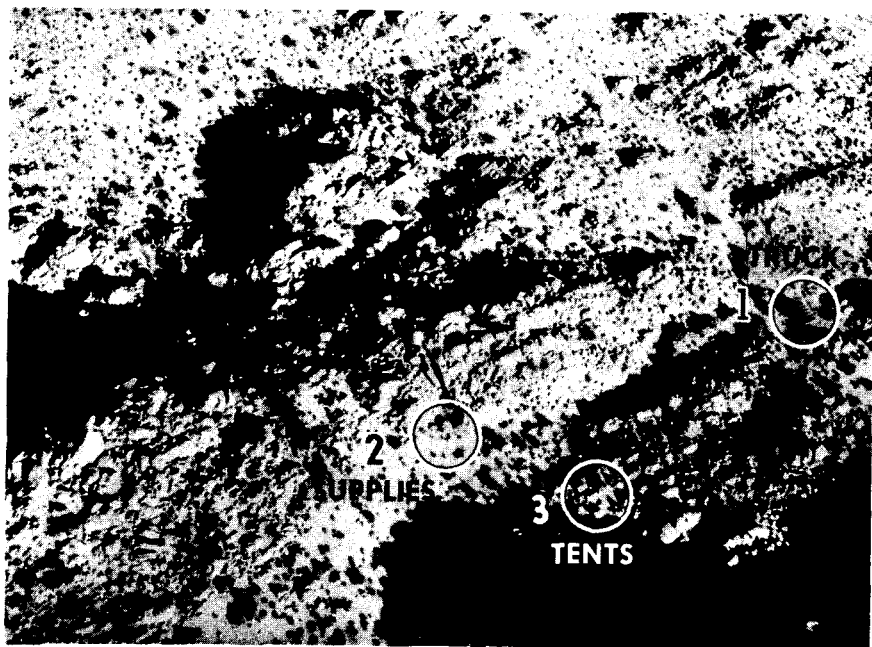




FIGURE 22.—Aerial view, from 4,000 feet, of a bivouac area in snow-covered terrain. Here, dark tones are almost as prevalent as white. Properly used, a mottled pattern of this kind aids the concealment of military objects. Many mistakes are apparent in this photograph. Compare the conspicuousness of the regularly aligned, OD-colored tents at 1 with the dispersed tents at 2. At 3, note the identifying tracks leading to a parked vehicle. At 4 is located an unpatterned pyramidal tent in the open. The road leading into and ending within the bivouac area at 5 is an obvious clue to the position. A long mess line and mess facilities are seen in the open at 6.

BIVOUACS IN

SNOW-COVERED TERRAIN

Although camouflage in snow-covered terrain follows exactly the same principles as other camouflage, it presents several special problems. A blanket of snow often eliminates much of the ground pattern, making blending difficult. Differences in texture and color disappear or become less marked. Untravelled roads and paths are obliterated. However, snow-covered terrain is rarely completely white, and by taking advantage of dark features in the landscape—communication lines, stream beds, evergreen trees, bushes, shadows of snow drifts, folds in the ground, and the black shadows of hill-sides—a unit on the move or in bivouac may often blend itself successfully into the terrain.

Good route selection is usually more important than any other single camouflage measure. Exposed tracks are the most dangerous foe to concealment under snow conditions. They can be concealed only by blending with the dark features of the landscape mentioned above. When moving into the bivouac area, extreme care must be exercised to avoid leaving exposed tracks pointing toward the site. The routing of vehicles will be difficult because of uncertainty as to the condition of the ground lying beneath the snow, but in every case their tracks must be continued past the bivouac area. Skis and snowshoes must not be used near the area since their marks are more sharply defined and more easily seen than foot tracks. When it is important to conceal vehicle tracks which have already been made, they should be smoothed out or sloped obliquely at the sides in order to minimize their shadows. To avoid tracking up an area, personnel, vehicles, and materiel should be restricted from open areas.

Vehicles to which a painted pattern has been applied are less conspicuous than those painted a solid white. Tentage and mess facilities may be painted white or pattern painted depending on the terrain surrounding the bivouac.

When practical and when it is certain that the enemy is aware of our presence in the locality, a decoy bivouac may be established.

Bivouacs which have been well concealed in snow terrain for some length of time can be identified easily when the snow melts, unless precautions are taken. This is because the compacted snow on much-used paths melts much more slowly than virgin snow, leaving clearly visible white lines on a dark background. When this occurs, the snow must be broken up and spread out to quicken its melting.

FIGURE 23.—Shelter tents painted white and situated in the shadow of trees are difficult to find. Care must be taken to break up triangular shadow made by opening at front of shelter tents. White clothing which facilitates concealment is available for personnel operating in snow-covered terrain.





FIGURE 24.—Shelter halves painted white and used in conjunction with post supports and natural materials to provide shelter and concealment. Trees and branches placed around the outside of the structure aid in camouflage. Whenever possible pile snow irregularly around tents and other objects to aid in blending.

FIGURE 25.—Close view of pyramidal tent effectively pattern painted. Note shield of evergreen foliage placed at exposed side of tent.





FIGURE 26 ①.—Fine-mesh wire screening mounded over supplies before snowfall. This material and feather-garnished chicken wire painted white are the most practicable materials for concealing supplies in a snow bivouac.

②.—Same scene after snowfall.





FIGURE 27.—Nets may be used as drapes if they are almost entirely white in color. They are most effective when covered with a light fresh snowfall, as shown here. The same result may be achieved by throwing on old snow. Drapes must extend to ground. Flat-tops are useless in open snow because of the shadows they cast. Net sets break under a 1-inch snow load.

FIGURE 28.—Best way to minimize conspicuousness of tracks, when on the move or in bivouac, is to follow communication lines or other lines which are a natural part of the terrain. Tracks coinciding with such lines are hard to identify. A turn-off from such lines must be concealed and the tracks themselves continued beyond turn-off point. Windswept drift lines cast shadows and should be followed as much as possible. Avoid making straight tracks to an important installation.



CAMOUFLAGE DISCIPLINE



FIGURE 29.—Paths within a bivouac area should be wired and taped. Personnel must be trained to follow such paths. Breaches of camouflage discipline must not be tolerated.



FIGURE 30.—In a more permanent location, short stretches of a newly made, much-used road may be covered by an overhead screen made of wire and cloth garnishing material. Notice tops of trees tied together in background.



FIGURE 31.—Guides are posted at entrances to concealment areas to insure that wired routes are followed and that turn-ins are not widened.



FIGURE 32.—Sometimes it is possible to tone down short stretches of newly made road by brushing leaves or placing brush upright over them. Complete concealment is extremely difficult, however, and only aerial observation can give an accurate check on the success of the work.

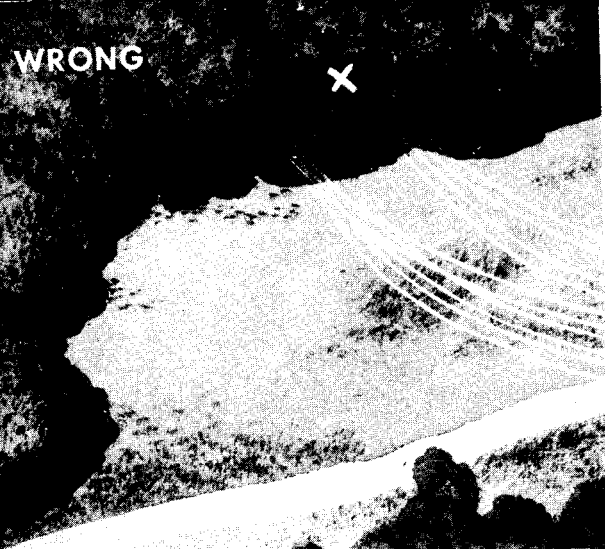
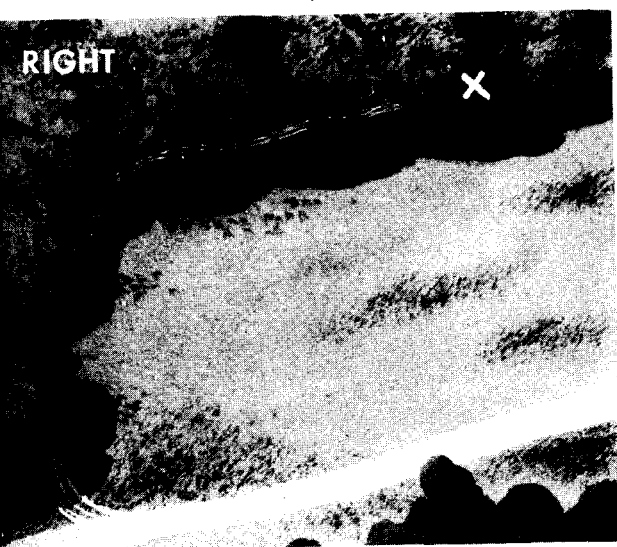


FIGURE 33 ①.—Do not make tracks directly to a concealed position across open terrain. Such signs are sure to attract attention of enemy aerial observer.



②.—Approach a concealed position by following terrain lines, enter area some distance away, reach position under cover, and continue past it to a natural outlet.

FIGURE 34. — Turn-off to installation (X) is carried beyond woodsto some natural termination, such as the house, and this additional section of road must be frequently traveled so that no difference between the two sections of road is discernible.



FIGURE 35.—Shine from carelessly exposed objects, such as mess kits, can ruin the best camouflage, betraying the presence of a military unit where there may be no other clue to its presence. Such objects must be kept under cover.



FIGURE 36.—Shine from the highly reflecting glass surfaces on a truck—windshield, windows, and headlights—can disclose to enemy observer the location of a bivouac. These surfaces must be covered with any available material. Here blankets are used to cover windshield of a truck.



FIGURE 37.—The white color of underclothing is conspicuous against darker surroundings. Such articles must not be allowed to remain where they can be seen from the air. Exposed laundry and other articles of equipment are definite clues to the location of a concealed bivouac.





FIGURE 38.—Mess line and mess facilities of a unit are critical points in any bivouac. Any activity which concentrates men or materials will tax concealment measures. Men tend to relax at meal time—and to relax in camouflage discipline *at any time* is dangerous. The above photograph shows mess line in sunlight although area is in woods. Notice shiny mess kits. Mess lines should be in shadows.

FIGURE 39.—A well-camouflaged kitchen area in a theater of operations. Artificial materials were necessary to form a complete overhead screen in this area since tree foliage was inadequate.



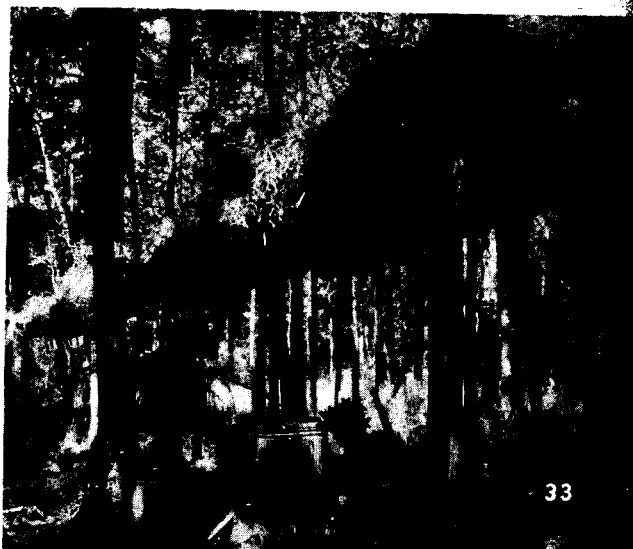
FIGURE 40.—One of the best ways to prevent shiny kitchen equipment from betraying a mess area is to keep kitchen in truck if possible.



FIGURE 41.—Kitchen waste can disclose a bivouac to aerial observers unless careful steps are taken to conceal spoil turned up when waste is buried.



FIGURE 42.—Smoke from kitchen fires must not be allowed to attract enemy to a bivouac area. Baffles, such as quickly erected one at right, dispel smoke effectively. Steps must be taken to camouflage baffle itself, however, against shine. Natural materials are used here.



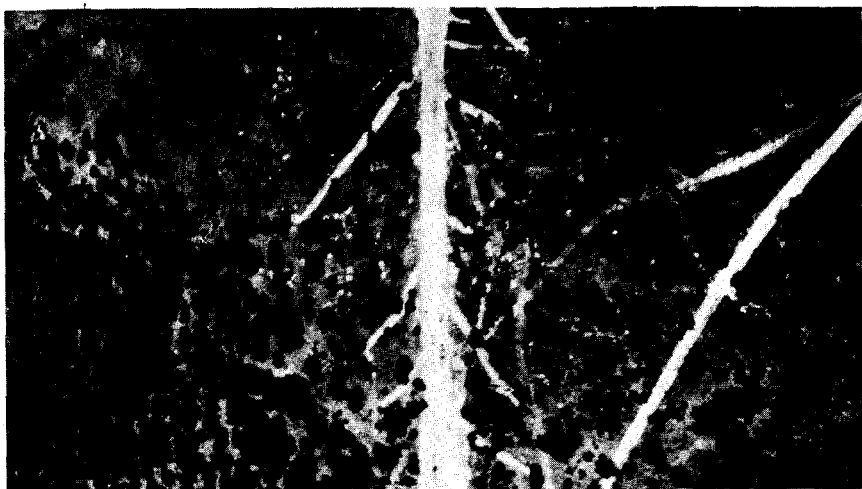
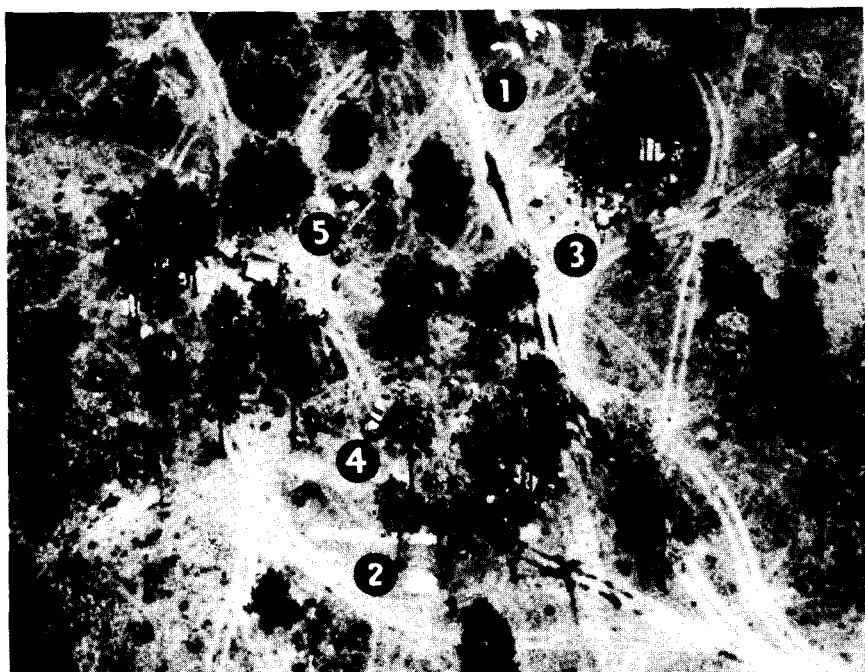


FIGURE 43.—This is an aerial photograph of a bivouac area taken at night. It is as clear as a daylight photograph, and it tells much to the enemy. Darkness is likely to produce lapses in camouflage discipline, but every effort must be made to maintain it. No amount of daytime camouflage can repair damage done by one night of bad camouflage discipline; neither the enemy nor his aerial camera is inactive at night.

FIGURE 44.—This is the kind of scene the enemy must not see. A thoroughly uncontrolled bivouac—a disgrace to the unit which made it. Among the breaches of camouflage discipline are: 1 tracks, 2 spoil, 3 laundry drying in open, 4 unconcealed trucks, and 5 tents in open.



Part II

CAMOUFLAGE OF COMMAND POSTS

The command post is the nerve center of a military unit and, therefore, is a target much sought by the enemy. Command posts have functional requirements which result in the creation of characteristic signs by which they may be readily identified. These characteristic signs are the first concern of camouflage.

SPECIAL CHARACTERISTICS.—Following are some of the signs which indicate to the enemy observer the possible presence of a large command post:

1. Converging communication lines—wire and road.
2. Concentration of vehicles.
3. Heavy traffic, which causes widened turn-ins.
4. New access routes to a position which could house a command post.
5. Protective wire and other barriers surrounding the installation.
6. Defensive weapons' emplacements around the installation.

The camouflage solution to these problems is much the same as that for bivouacs. The primary factors are intelligent use of the terrain and strict enforcement of camouflage discipline. The command post is simply a specialized kind of bivouac, with a few additional problems of concealment peculiar to it.



FIGURE 45.—A swiftly established command post of a unit in the advance. When no existing buildings are available, natural concealment is sought. But a command post is too important to take chances with. Here an overhead screen which blends with surrounding foliage conceals the activities of a busy headquarters.

CHOICE OF POSITION.—The site requirements of a large command post are essentially the same as for a good bivouac: preliminary reconnaissance and layout by quartering parties, rapid concealment of elements, camouflage discipline, and a well-policed track plan to prevent visitors violating it. There is one important additional consideration: a large headquarters is likely to remain in an area for a greater length of time than a bivouacked unit. Therefore the site must be capable of being continuously occupied, sometimes for days, while offering a minimum chance of being disclosed through changes in the surroundings.

It is unwise to locate a headquarters in the only large buildings within an extensive area of military operations. It is too obvious a place for such a post. Whether signs indicate it is being used as a headquarters or not, it is likely to draw enemy fire. If the post is located in a building, there must be enough other buildings in the neighborhood to prevent pin-pointing the target.

ACCESS ROUTES.—Communications are the life blood of a command post: a headquarters is effective only when it is possible to maintain a rapid exchange of intelligence and decisions between its numerous subordinate elements and the headquarters. Command posts sited to take advantage of existing roads and telephone and telegraph wires are easiest to conceal since new communications need not be created and terrain can remain unchanged. When new communication means must be created, natural cover and terrain lines are used.

CAMOUFLAGE DISCIPLINE.—After the site has been selected and after camouflage has been erected to supplement whatever natural concealment is available in the position, continued concealment depends on camouflage discipline. Tracks, as always, must be controlled. Vehicles should, if possible, be parked several hundred yards—or sometimes farther—from the command post. Security weapons' emplacements must be concealed; tracks to them must be inconspicuous. All spoil must be concealed. Protective wire and communication wire must follow terrain lines and be as well concealed as possible. Night blackout discipline must be rigidly enforced. Routes to parking areas for visitors must be maintained in accordance with the track plan.



LAYOUT OF A COMMAND POST

FIGURE 46 ①.—Even a hasty glance at this scene would tell the enemy observer that this is a command post. All the telltale signs are there. They are military marks on an otherwise ordinary rural scene.

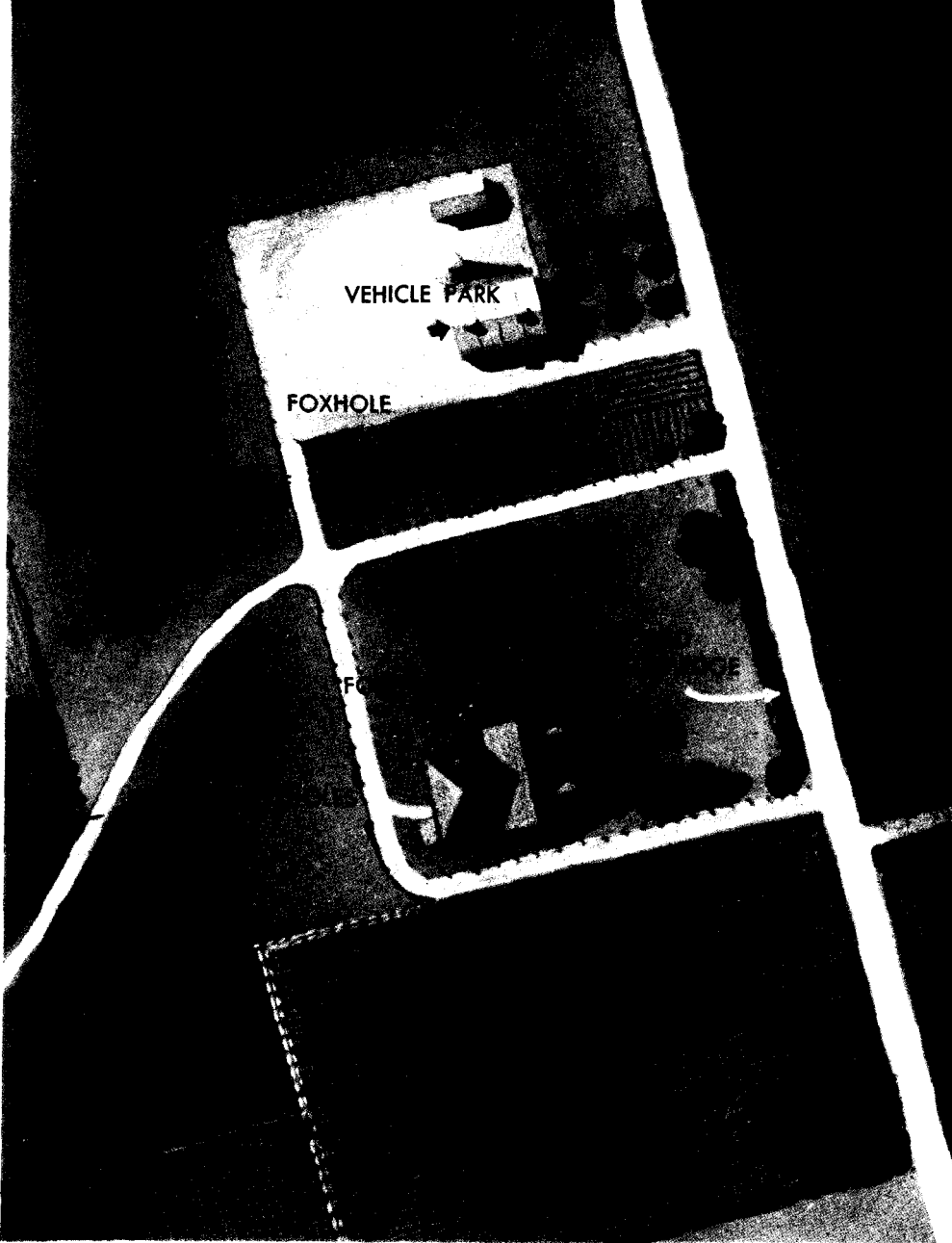


FIGURE 46 ②.—There is nothing in this rural scene to arouse suspicion of enemy. Such a controlled command post is possible only if a camouflage plan has been made in advance of occupation and followed closely. Most vehicles should be parked under cover at a distance from the command post. Personnel should proceed on foot to the building itself. Protective wire follows terrain lines.



FIGURE 47. — By continuing existing road (dotted lines), a traffic loop is created. This makes a conspicuous turn-around unnecessary. It also provides access to vehicle park concealed in woods at a distance from the command post.

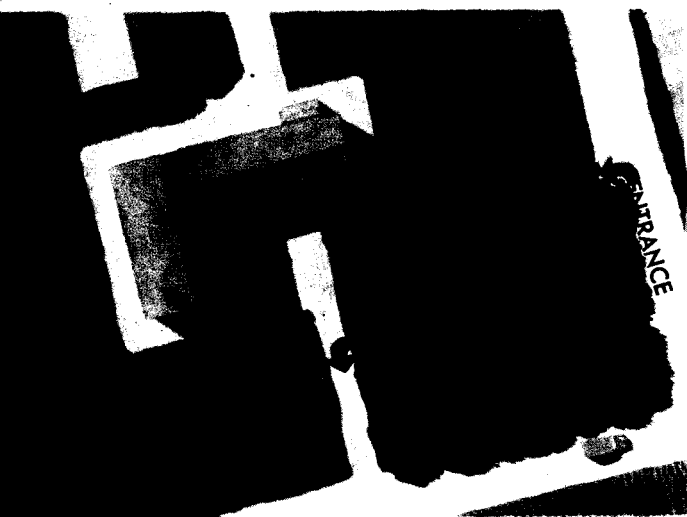


FIGURE 48.—Small parking area for visitors. Overhead cover is created by placing natural materials in wire netting. Unless overhead cover is available, visitors' vehicles must not be permitted to park near command post.

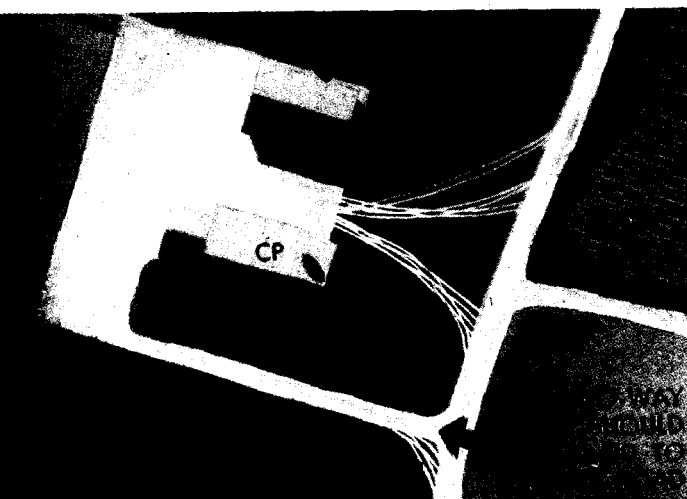


FIGURE 49.—Tracks must be controlled and all traffic restricted to existing paths and roads. Edges of road turn-offs, intersections, and short narrow roads subject to heavy military traffic are wired in to prevent conspicuous road widening and corner cutting.

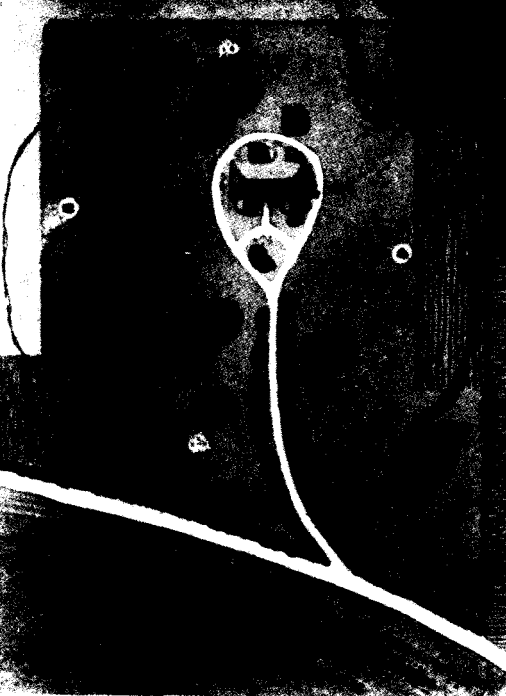


FIGURE 50 ① and ②.—Layout of protective wire shown on left will invariably attract attention to a command post it surrounds. Wire must not be laid across fields in lines contrary to normal ground pattern, but along existing lines of cultivation and along natural boundaries, as shown at right.

FIGURE 51.—Communication wires are concealed by running along terrain features to destination. Scars made by burying cables are concealed by following road's edge. Wire may be strung from tree to tree, or, when poles are necessary, they should be placed along existing terrain lines. Maintenance crews, especially, must beware of making tracks which converge toward command post.



CP IN OPEN TERRAIN

In open terrain where natural concealment is afforded only by small scrub growth and rocks, overhead cover can be obtained by the use of drapes and flat-tops.

Position for the command post must be chosen so the installation may be tied into terrain features. Even in the desert, broken ground and scrub vegetation form irregular patterns with which artificial materials may be blended.

In open terrain particularly, dispersion is important. Routes between units must be either concealed or made by indirect courses, not in straight lines.



FIGURE 52 ① and ②.—Drapes, placed to resemble surrounding terrain, cover headquarters in desert. Note compact assembly of vehicles under framework being erected to simulate mound shown below. Installation is effective against both direct and photographic observation. This is a necessary exception to dispersion; vehicles are dispersed by groups rather than by individual vehicles.



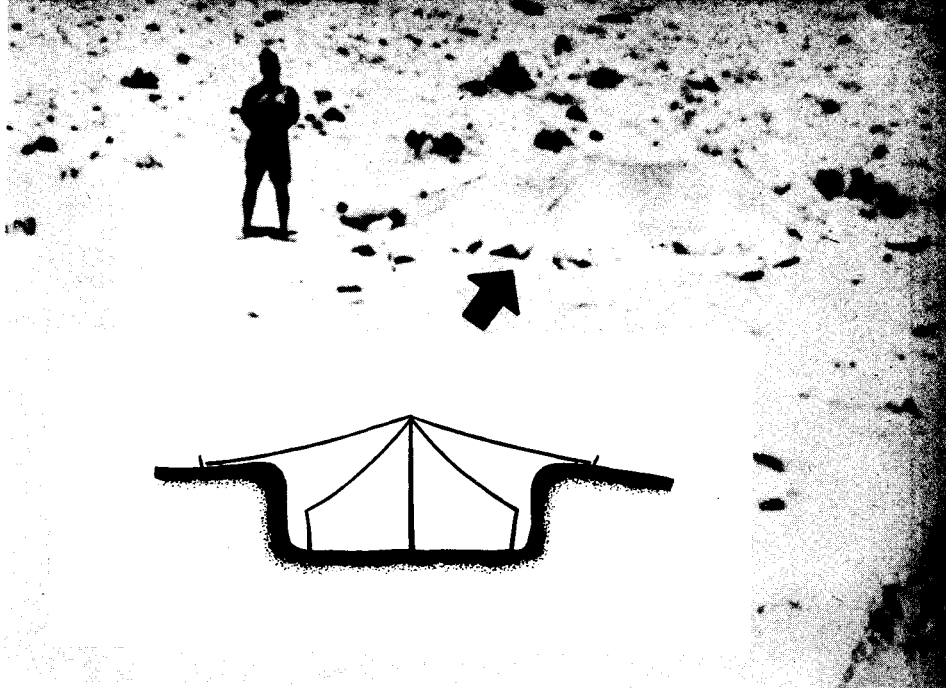


FIGURE 53.—Digging in reduces cast shadow and silhouette, simplifies draping of pyramidal tent. Drape used above is small-mesh shrimp net, which requires no garnishing. Excavation is approximately 18 inches wider on all sides than tent dimensions.

FIGURE 54.—Command post tent dug in to lower silhouette, draped to simulate scrub vegetation. Drape used is large-mesh twine net, which supports artificial garnishing material. Spotting plants over net ties it in with surrounding terrain pattern.

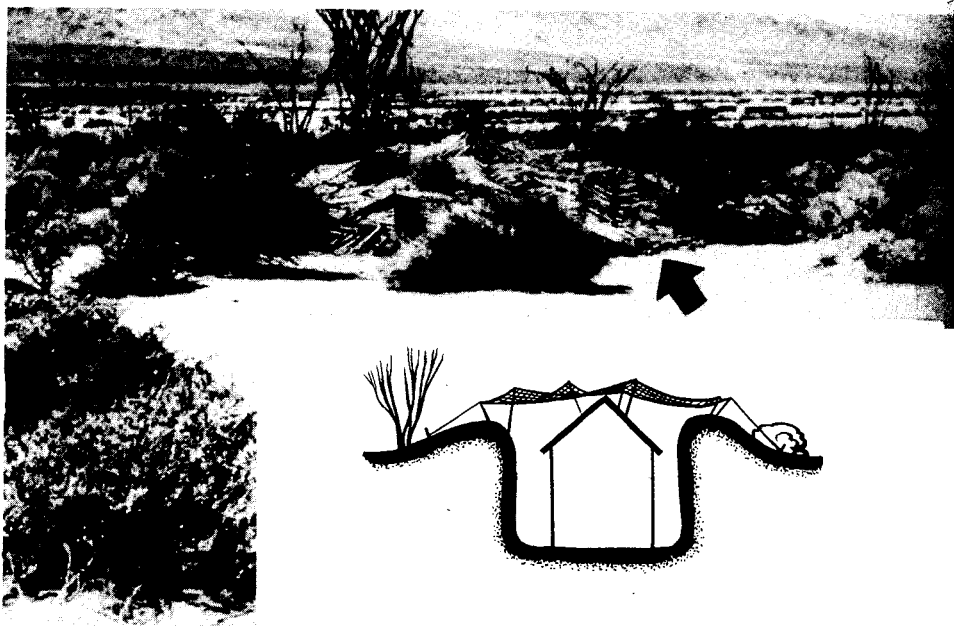




FIGURE 55.—This is a good locality for a command post. However, CP chosen was wrongly located in large building at upper right, by far the largest building in the area and therefore conspicuous. It is further betrayed by faulty camouflage discipline—new vehicle routes across open areas, enlarged turn-ins, and additional turn-arounds. In a village like this, command post elements should be dispersed among the numerous small buildings available. Vehicles must not be allowed to betray the presence of unusual activity in their vicinity. Traffic must be rigidly controlled.

CP IN URBAN AREAS

Headquarters in existing civilian structures presents the problem of hiding movement by day and of concealing the evidence of activity at night, when blackout conditions usually prevail. Military movement in a village or group of farm buildings is not easily discovered if kept to a minimum.

Attempts to alter the appearance of buildings by disruptive painting is evidence of occupation and simply reveals a military installation. Erection of a small structure simulating a new garage or other auxiliary civilian building is unlikely to arouse suspicion, but major changes will be closely scanned by enemy air observers.

When buildings are partially destroyed and debris-littered, installations may be camouflaged with debris to blend with the rough and jagged lines of their surroundings. A few broken timbers, pieces of lath, plaster, and scattered rags will accomplish quick and effective concealment. Other debris usually available as camouflage material includes rubble, scrap metal, wrecked vehicles, and furniture.

DECOY CP

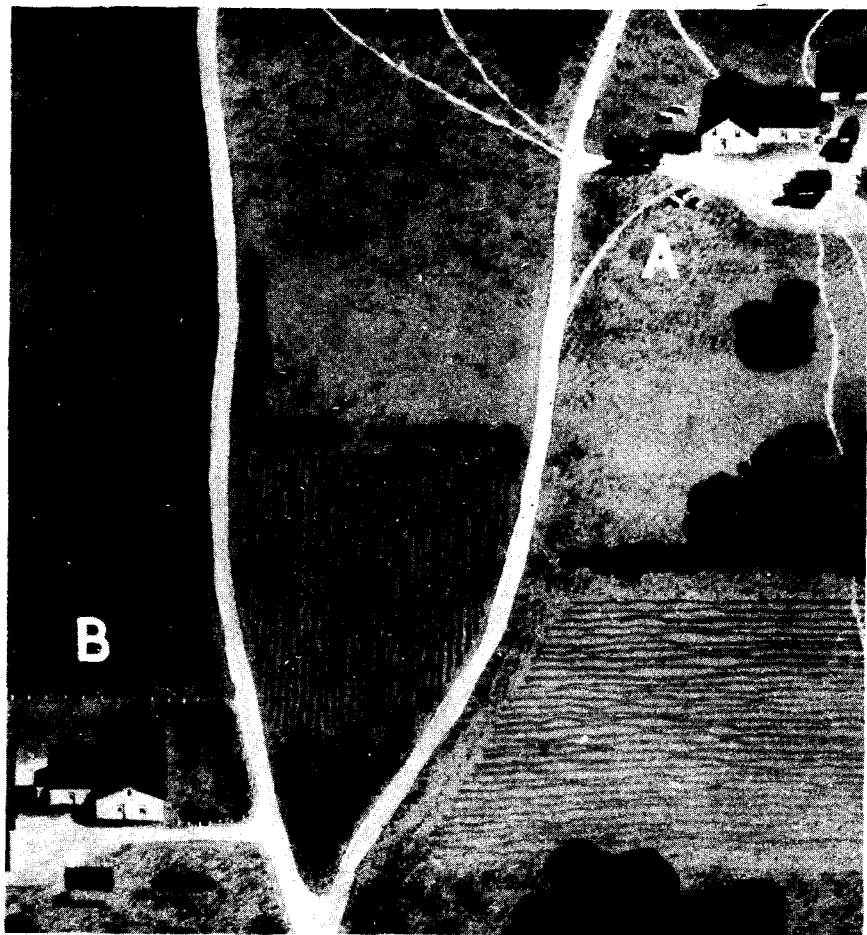


FIGURE 56.—When it is impossible to conceal from enemy the fact that a command post is in a certain area, enemy can be confused by installation of a decoy command post. Such a decoy must not be overdone. It is constructed on approval of the force commander. In this illustration a decoy, A, has been installed in the neighborhood of the real command post, B, but far enough away so that bombing of the decoy will not endanger the actual headquarters. Certain characteristic signs of such installations are made near the decoy: cross-country tracks simulate the work of hasty wire-laying parties; smoke and occasional lights indicate lapses of camouflage discipline; some incompletely camouflaged tents aid the deception. Some activity of a military nature must be carried on around the decoy. New tracks made from day to day carry on the deception scheme. Vehicles should be seen.

CAMOUFLAGE OF SUPPLY POINTS

The problem of camouflaging supply points includes all the difficulties of both bivouac and command-post concealment—plus a number of particularly troublesome factors peculiar to supply points alone.

Supply points vary in size from large concentrations of materials in rear areas to small piles of supplies behind the front lines—in either case a profitable target for enemy bombardment and shelling.

From a camouflage standpoint, the large area covered by a supply point is a primary problem. The pictures on the opposite page illustrate the magnitude of the job. Huge piles of equipment of all kinds are brought up quickly, must be unloaded quickly to allow the carriers to return for more, must be concealed quickly, and yet must be easily accessible for redistribution and reloading on other carriers. Flat-tops are an effective solution if the supply points are not too large, if time and materials for their erection are available, and if they can be made to blend with the terrain. For supply points which cannot be concealed, decoy supply points will often divert the force of an enemy attack.

The rest of part III illustrates simple, hasty methods of concealing supplies. These are adaptable to almost all types of supplies, including ammunition and gasoline. In the case of the latter, the installation is surrounded by a trench to prevent the spread of fire. The shadow contained within new trenches, and spoil removed from them, are concealed or broken up with artificial or natural materials.

PLANNING SUPPLY POINTS

Supply points make use of natural cover and concealment whenever possible. Stacks of supplies are dispersed to minimize damage from a single bomb. Also, in planning dispersion, advantage is taken of natural concealment. New access roads and paths are planned to use existing overhead cover. In more permanent installations, tracks running through short open areas can be concealed by overhead nets slung

FIGURE 57 ①.—One view of the camouflage problem. Part of an engineer supply point, with oil drums in background. In a combat zone, it may be expected that a scene like this will be subject to exploding bombs and burning gasoline.



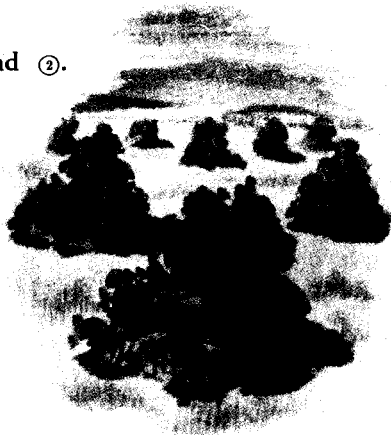
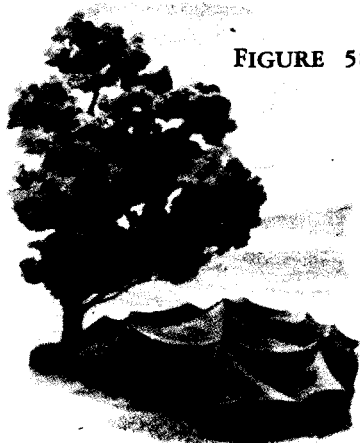
FIGURE 57 ②.— A troublesome part of the camouflage problem. A class-I supply point, badly organized and incompletely concealed. Loading trucks are jammed close together, along with unconcealed supplies. One well-placed bomb here could cripple a whole operation.



FIGURE 57 ③.—Another side to the problem. A beachhead with supplies stacked hastily at water's edge. In an operation of this kind, congestion is unavoidable. As soon as possible, supplies should be sorted into the smallest practicable groups, dispersed, and concealed under natural overhead cover or in one or more of the ways suggested in figures 55 through 77.



FIGURE 58 ① and ②.



between trees. Traffic control includes measures to conceal activity and movement at, to, and from the installation.

Even when natural cover is sparse or nonexistent, natural terrain features are used to advantage. The background is studied and used. Terrain features are used by stacking supplies in the shadows or dark areas created by these features or by stacking supplies so that the stacks resemble the features. Figures 59 to 74 illustrate the use of background combined with the use of natural or artificial materials.

Camouflage discipline measures at supply points include track plans that result in a minimum of changes in the appearance of terrain, control of debris so that it does not accumulate and attract enemy attention, concealment and control of trucks waiting to draw supplies, and maintenance of camouflage measures.

When supplies are stacked in a rectangular shape, they are made to blend with the color and texture of the background either by distributing natural materials over the tarpaulin covering the supplies or by draping supplies with garnished camouflage nets (fig. 58 ①). Nets are propped off the supplies so the shape of the installation is irregular.

Supplies stacked in a pyramidal shape may be made to resemble bushes and small trees by placing natural materials on the pyramid (fig. 58 ②) or by draping with a garnished net. One advantage of a pyramidal stack is that it makes a smaller shadow than other shapes.

Supplies may be stacked in the shadows beside walls or stone fences, in ditches, trenches, folds in the ground, or among rock outcrops. Supplies replacing real stones in stone walls preserve an innocent appearance. Supplies may be stacked to simulate many other terrain features.



FIGURE 59 ①.—Barren country broken by ridges, as in this picture and in picture below, offer excellent terrain patterns for both distribution and concealment of supplies. Above, supplies are strewn parallel to ridge at its base, where there is shadow part of day. Covered with rocks and scrub growth, supplies are inconspicuous.

FIGURE 59 ②.—Here, a shallow dip in the ground is filled with supplies, in a natural extension of the rolling lines. Correct texture is secured by covering supplies with material from surrounding area. Arranged irregularly, they will not attract attention from the air.





FIGURE 60 ①.—Dis-used earthworks employed for concealment of supplies. Below ③ is close-up of stacked portion of old fortifications. Sections of wall are removed and replaced with supplies. Additional excavation must not be overdone.

FIGURE 60 ②.—Enlargement of part of same area as in ①, showing additional supplies laid out in abandoned trench system.



FIGURE 60 ③.—Section of trench with supplies.

FIGURE 61 ①.—Methods of using old positions to conceal stores. Real trenches contain one or two rows of boxes. False trenches are made by stacking boxes and covering with open-mesh cloth. Extra row of supplies may be placed in false excavations. Details of this method are shown in figures 61 ② and ③.

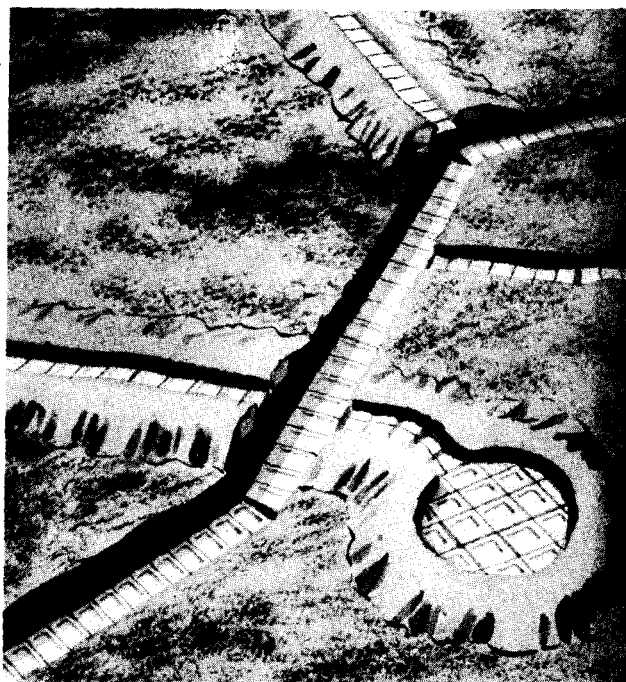
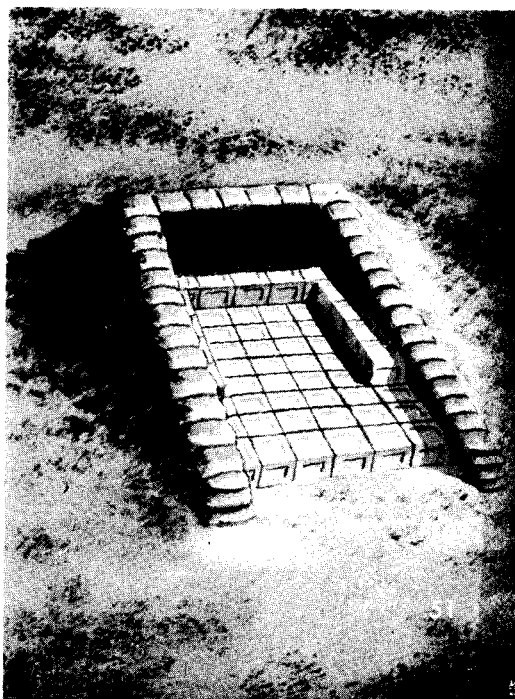


FIGURE 61 ②.—Supplies stacked in abandoned weapon pit.



FIGURE 61 ③.—Abandoned vehicle pit with stacked supplies.



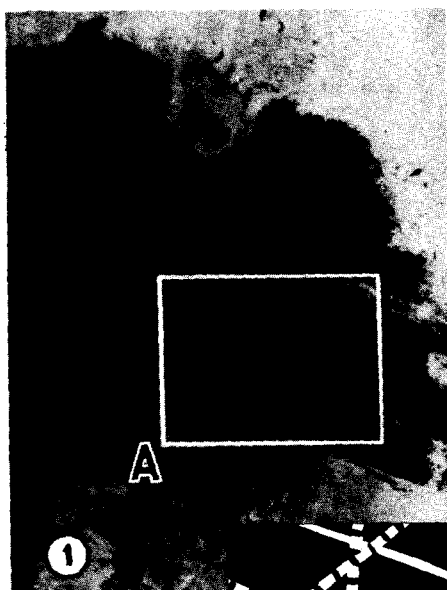


FIGURE 62 ①, ②, and ③.—Aerial photo and sketch of well-tracked dry salt lake in desert. Section at A ① is typical of area which might be chosen for a supply point. Sketch ② is a diagram of supplies in A laid out to simulate tracks in area; ③, details of stacked supplies.

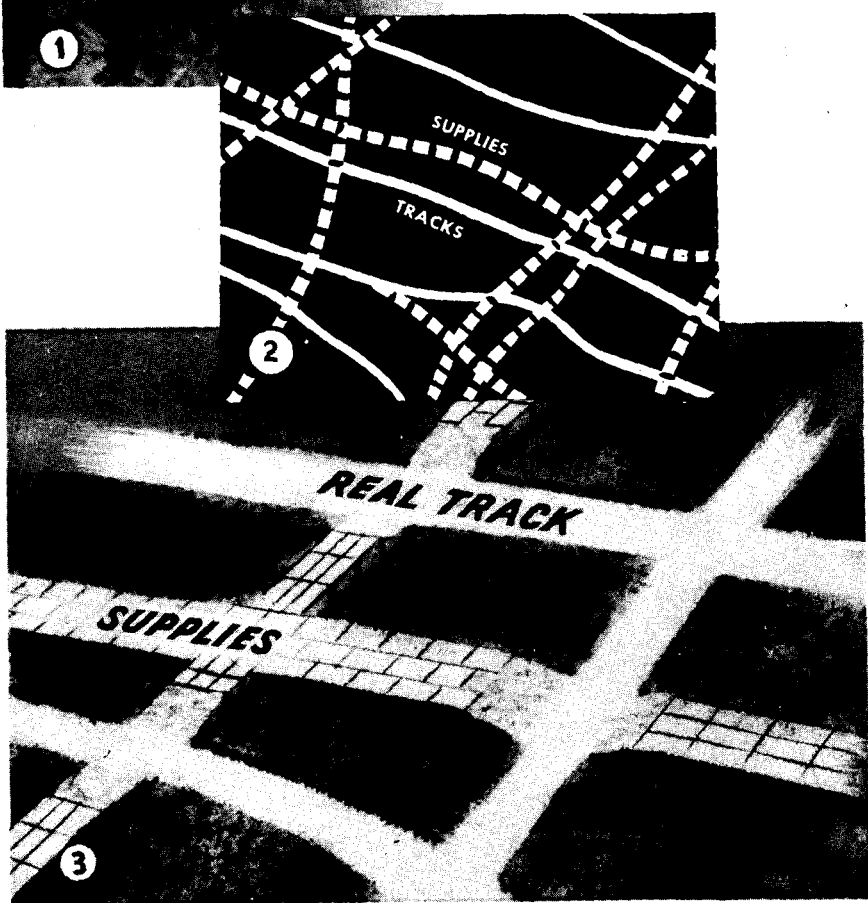




FIGURE 63.—There is nothing magical about the concealment qualities of a twine net. One of its primary purposes is to break up outline of object to be concealed. It must not be draped, as above, so shape of supply pile remains unchanged; it must not be used ungarnished.

FIGURE 64.—A good example of dug-in and draped supplies in a barren area. In front of the two men is a concealed store of supplies covered with sand and scrub growth from surrounding area. It is so well dug in that not even a shadow remains to betray its presence.





FIGURE 65.—Natural materials used to conceal stacked supplies located in shade of trees.

FIGURE 66.—Drape of garnished twine net supplements concealment offered by tree. This is good application of a drape—to tie a concealed object into a nearby object in terrain.





FIGURE 67.—There are few kinds of terrain which will not have to be used to store supplies—and there are few kinds of terrain for which there is no solution. Here, for example, in a cultivated field, supplies have been laid out along cultivation lines and textured with strip-garshed twine net to resemble standing stubble.

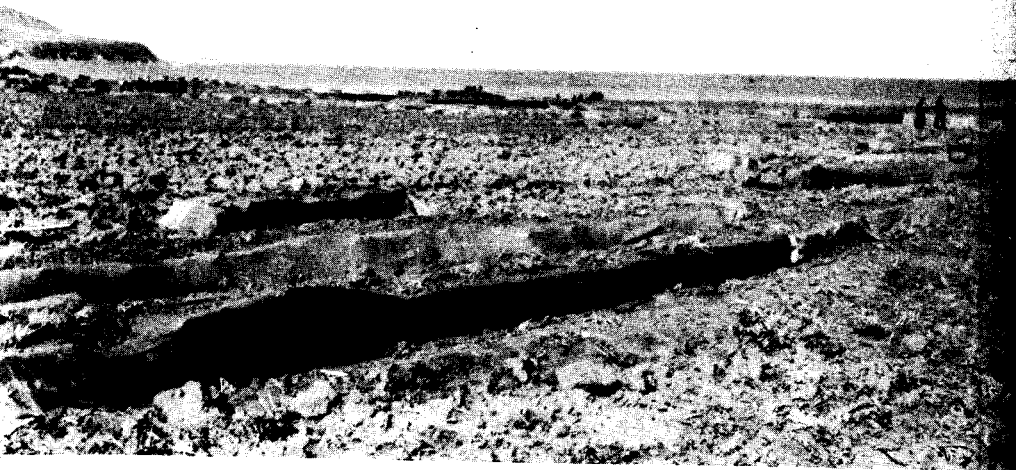


FIGURE 68.—The plowed field usually spells trouble to attempts at camouflage, but here supplies have been stacked parallel to the furrows and covered with earth-colored burlap. From the air this is effective concealment. Access routes are made along furrows and no unnatural lines appear on the pattern.

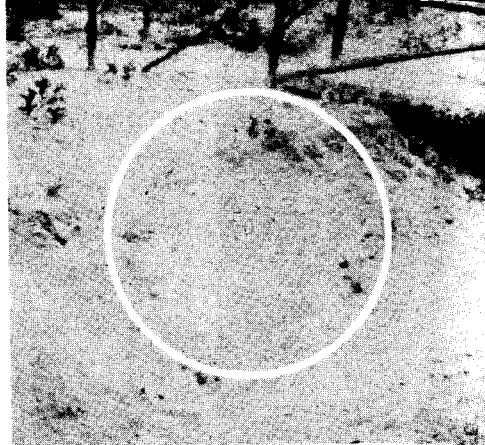


FIGURE 69 ① and ②.—An embankment is a convenient place in which to dig in supplies. Here an excavation has been made, supplies laid in, and the opening covered with cloth reinforced with slats. Pit with cover on is almost invisible, even to the ground observer.

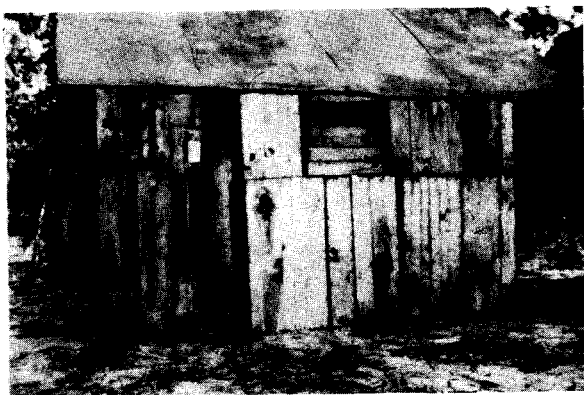


FIGURE 70 ① and ②.—Two examples of deception in hiding supplies. Boxes have been stacked in a mass to resemble buildings. Simple frame roofs complete the disguise. Such roofs are designed to resemble type of buildings found in the area.

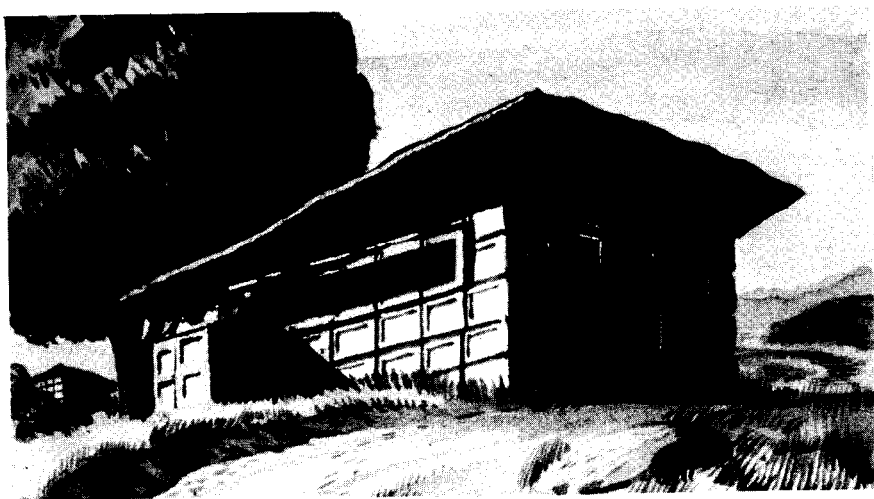


FIGURE 71 (a).—The frame-work for a “hay-stack” is made by lashing poles together to form a hemisphere.

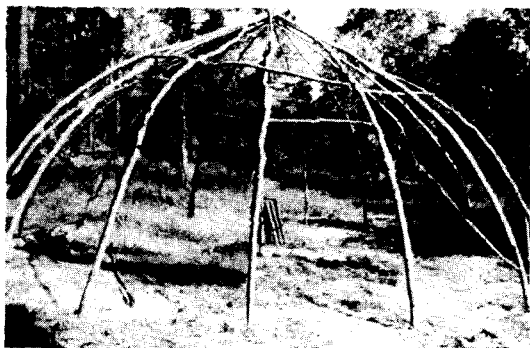


FIGURE 71 (b).—Thatching is laid on in sections. Attach hay to cloth base by means of an adhesive. Sections are wired to frame.



FIGURE 71 (c).—Simple hinged door permits easy access to stored supplies.



FIGURE 71 (d).—Completed haystack.



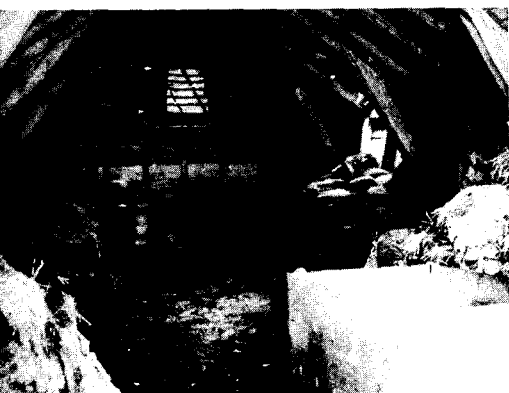
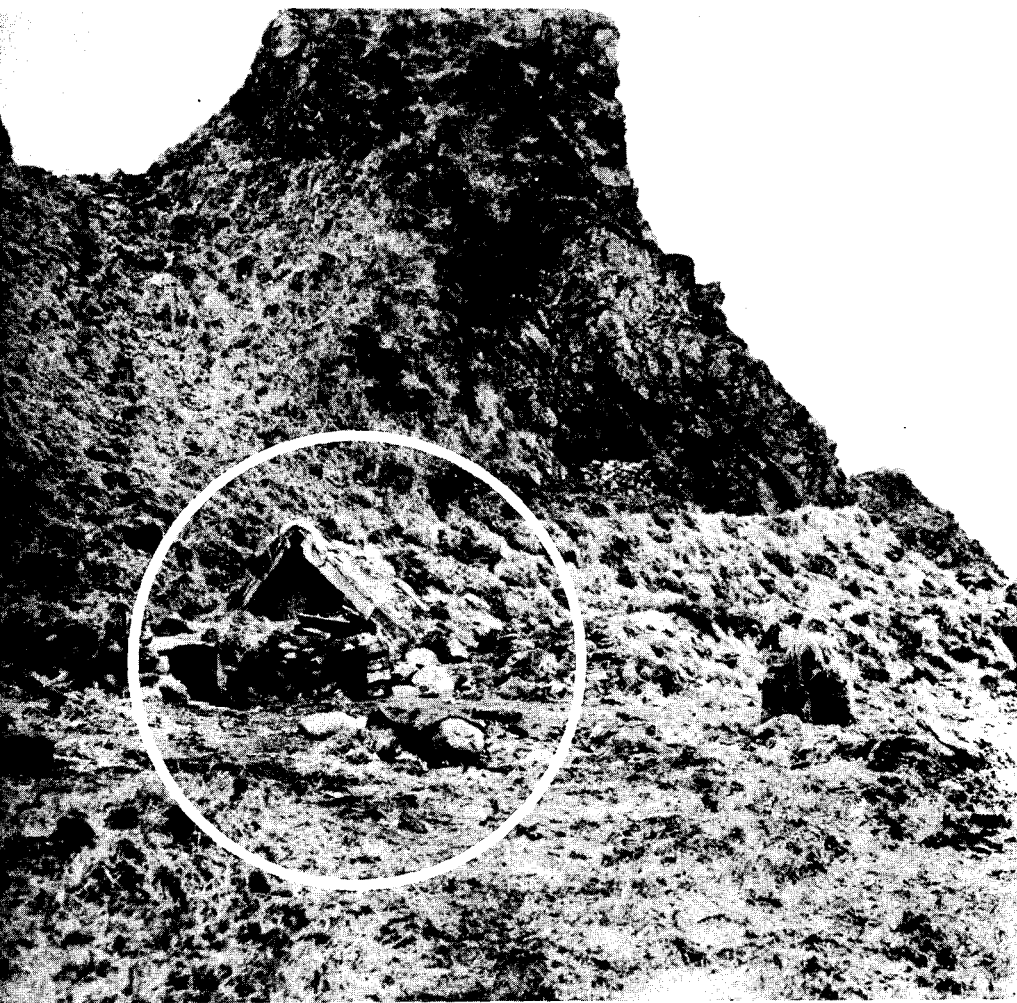


FIGURE 72 ① and ②.—From a theater of operations. A supply building constructed at base of a rock outcrop and completely covered with vegetation from surrounding area. Part of vegetation has been removed (circle) to show form of building. Notice how roof line continues line of vegetation. At left is interior view showing size of building.



FIGURE 73 ①, ②, and ③.—Supplies concealed beneath an imitation rubbish heap. A simple wooden frame covered with bags and other rubbish is all that is necessary.





FIGURE 74 (a) and (b).—Supply trenches, sited in woods with insufficient overhead cover, being concealed with flat-top. Net is erected before digging is begun. In above photo, net has been removed to show details. Below, with garnished twine net in place, shadows of trenches are broken up.





FIGURE 74 (c) and (d).—Above, view showing excellent matching texture achieved by well-garnished flat-top over supply trenches in (a) and (b). Below, completed job, with imitation trees made of chicken-wire cones garnished with artificial materials and sited to break up what shadows remain at edge of net.



DECOY SUPPLY POINTS

Often it is impossible for an army unit to conceal the fact that a supply point is in an area. When this is the case, attempts are made to distract the enemy's attention from the real installation. This is done by constructing decoys to draw enemy fire. Such decoys are built to deceive a shrewd and wary enemy: they must be well done, they must not be overdone. They are constructed on the order of the force commander. A successful decoy operation of the size of a large supply point requires careful planning and execution.

Sometimes the decoy can be made in a relatively simple manner by forming a network of tracks near a wooded area which could possibly hide a supply point—and which may, in fact, hide a real one some distance away.

Circumstances may prevent successful concealment of the real supply point altogether. In such a case, if a number of decoy supply points are made realistic enough at distances approximately 1,000 yards from one another, the enemy—in the absence of ground reconnaissance—will be forced to distribute his attacks over the false as well as real supply points. If the decoys are well managed to simulate supplies burning under attack, the operation may well draw the bulk of the enemy attack away from the real supply point.

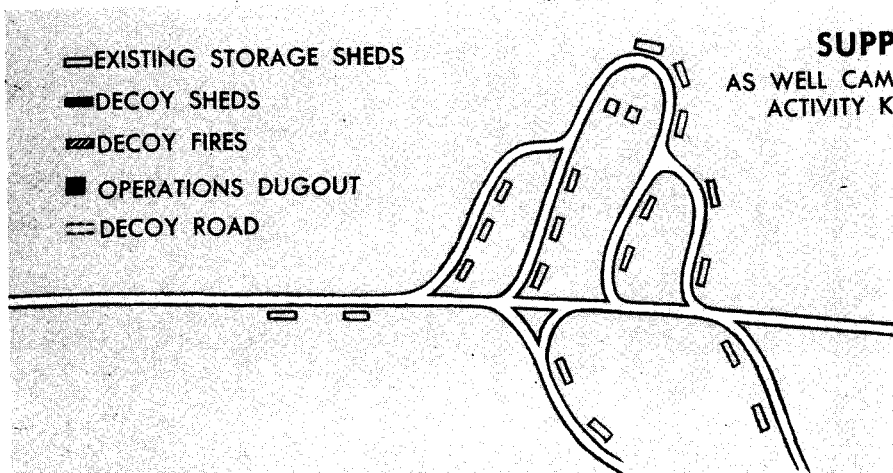


Figure 75 is a schematic diagram of decoy supply points showing their relation to a real supply point. In the case of large important installations, the construction of several decoys is often more advantageous than the construction of a single decoy. This is especially true when the real installation is sited by necessity in an area where concealment is impossible or when, even if concealed, the enemy has already pin-pointed it. Enemy attacks as a result of the use of this system are dispersed by offering several instead of one target. Decoys of this type may be on an extremely large scale and may be constructed to deceive both day and night observation. For daylight deception they may include considerable false construction to simulate roads, buildings, tentage, vehicles, personnel, and stacks of supplies.

Troops must be detailed to a decoy installation to maintain an appearance of activity corresponding to the activity normally a part of the real supply point. It has been found that approximately one-quarter of the personnel stationed at the parent site is required to maintain realistic activity at a decoy. New tracks, scars in the ground surface, and movement of false vehicles and supplies are essential decoy activities.

For night deception decoy fires, made by flame throwers, oil baths, smoke pots, or other means, are operated elec-

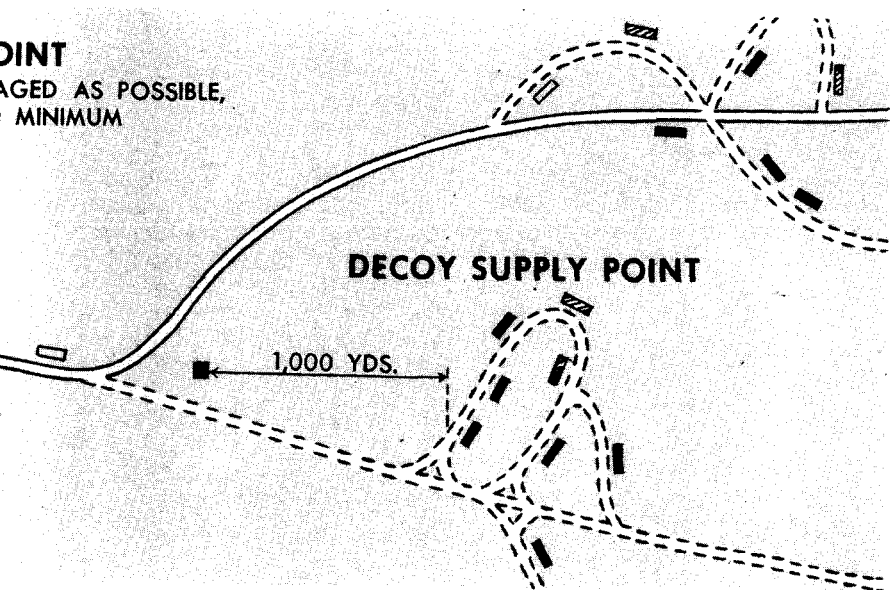


FIGURE 75.

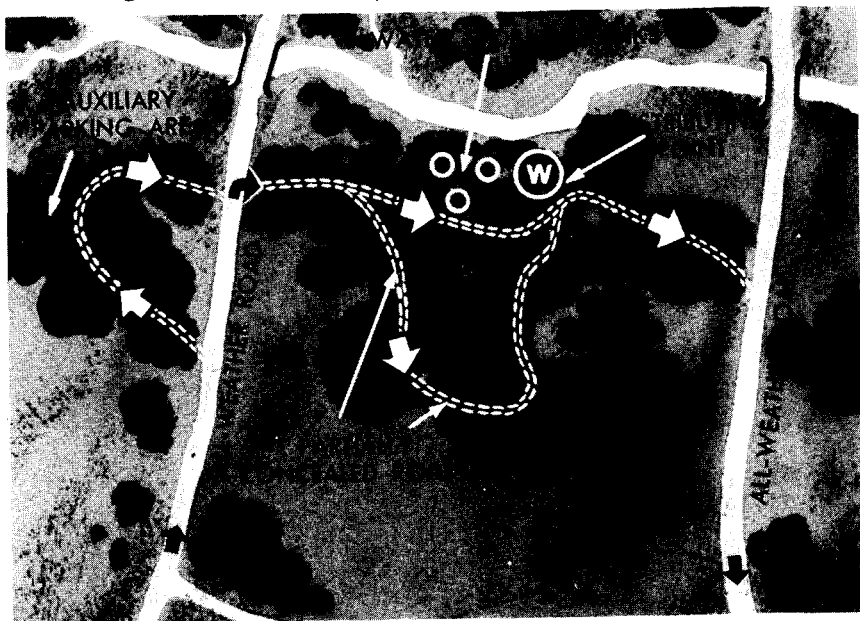
trically by remote control from an operations dugout located a safe distance from the decoy targets. To act as bait for enemy planes at night, electric lights, also controlled from the operations dugout, may be installed in tents and false buildings at various locations within the decoy supply point. At first warning of the approach of enemy planes all lights are switched on. When the planes have approached to within 5 miles, all except one or two lights are switched off to make it seem as though they have been overlooked. As planes come closer to the decoy, all lights are switched off. Decoy fires are started only when bombs are dropped near the decoy.

WATERPOINTS

Factors which aid in concealment of water points are:

1. Adequate concealed road net at supply point.
2. Sufficient natural concealment to hide waiting vehicles.
3. Adequate concealment—artificial or natural—for operating personnel, storage tanks, and pumping and purification equipment.

FIGURE 76.—Diagram of water point, showing desirable features for camouflage and camouflage discipline.



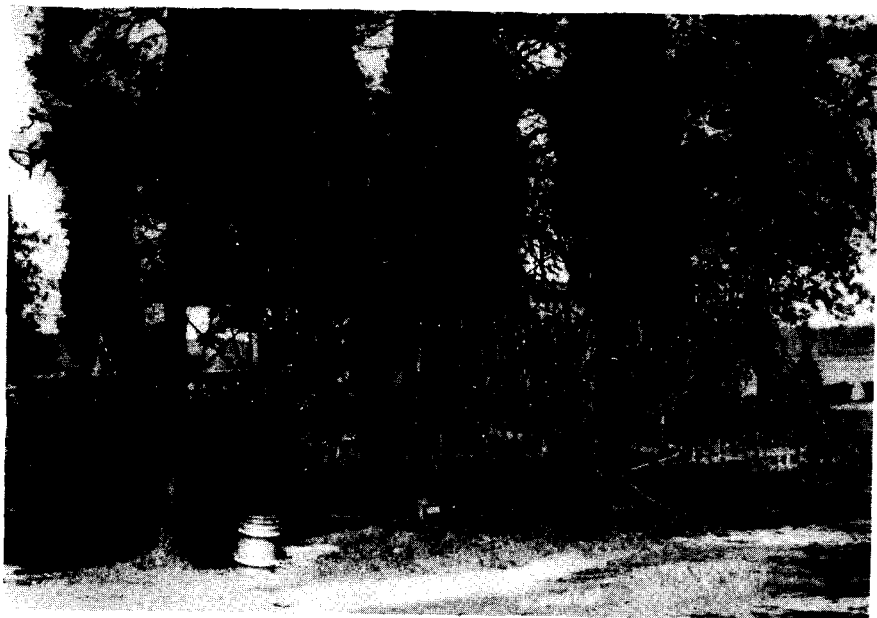


FIGURE 77.—Water storage tanks at a water point, well sited and well concealed. Natural overhead cover has been supplemented by fabric-garnished net placed over tank to screen canvas cover.

4. Strict enforcement of camouflage discipline.

5. Control of spilled water; adequate drainage to prevent standing pools of spilled water, which reflect much light.

Foliage not sufficiently thick for perfect concealment is supplemented by natural materials, flat-tops, or drapes. Concealment is required for water-point equipment, the shine of water in tanks, and small open areas that must be crossed by vehicles or personnel in operating the water point. Shine on water can be concealed by canvas covers or foliage, but the characteristic shape of the tanks must be concealed or well broken up by foliage or artificial camouflage materials.

Camouflage discipline at a water point requires a water supply schedule for using units. Lack of a schedule, or violation of a schedule, usually produces a concentration of waiting vehicles which cannot be concealed.

Where several small water points are available, it is preferable to use them all rather than a single large one, both for ease of concealment and for convenience of using units.

The above principles and practices are applicable to water distributing points served by tank trucks.

Part IV

CAMOUFLAGE OF MEDICAL INSTALLATIONS IN A DIVISION AREA

In a theater of operations, the camouflage of medical installations is a command decision. However, the tactical disposition of our troops may be disclosed by conspicuous medical installations, so it may be advisable to camouflage them.

Advanced medical installations are usually temporary in character and location. The problem of camouflage will be greatly simplified through employment of the following means:

1. Careful choice of position under natural cover or in buildings.
2. Hasty camouflage measures to supplement inadequate natural concealment.
3. Selection of inconspicuous or concealed access routes before occupying a position.
4. Camouflage discipline to avoid making careless tracks and to prevent unnecessary exposure of vehicles, equipment, or personnel to enemy observation in daytime.
5. Complete blackout at night.

BATTALION AID STATIONS

The battalion aid station (fig. 78) is located near the sector where the greatest number of casualties is expected and close enough to the action so that the litter carry is short. However, a position should not be sited close to prominent landmarks, such as road intersections, bridges, or unusual topographic features, which may assist the enemy in locating the position. When possible, litter bearers should follow concealed routes so as not to disclose the location of a station.

Ideally, the elements of the battalion aid station (fig. 79) are arranged in a position so they blend with the surroundings well enough to eliminate the necessity of adding cut foliage or debris, or erecting other camouflage materials. Assuming that maximum advantage has been taken of over-



FIGURE 78.

head concealment (fig. 80), additional camouflage work necessary after the installation has been sited should be constructed swiftly to avoid delay in the primary function of front-line medical installations—prompt evacuation of the wounded. When camouflage nets are available, inadequate overhead concealment may be improved by the erection of nets garnished to match the surroundings and used as hammocks or slope screens. If wire netting or wire strands can be secured, an overhead network may be quickly constructed to support small cut trees or branches. Such foliage must be replaced as soon as it wilts.

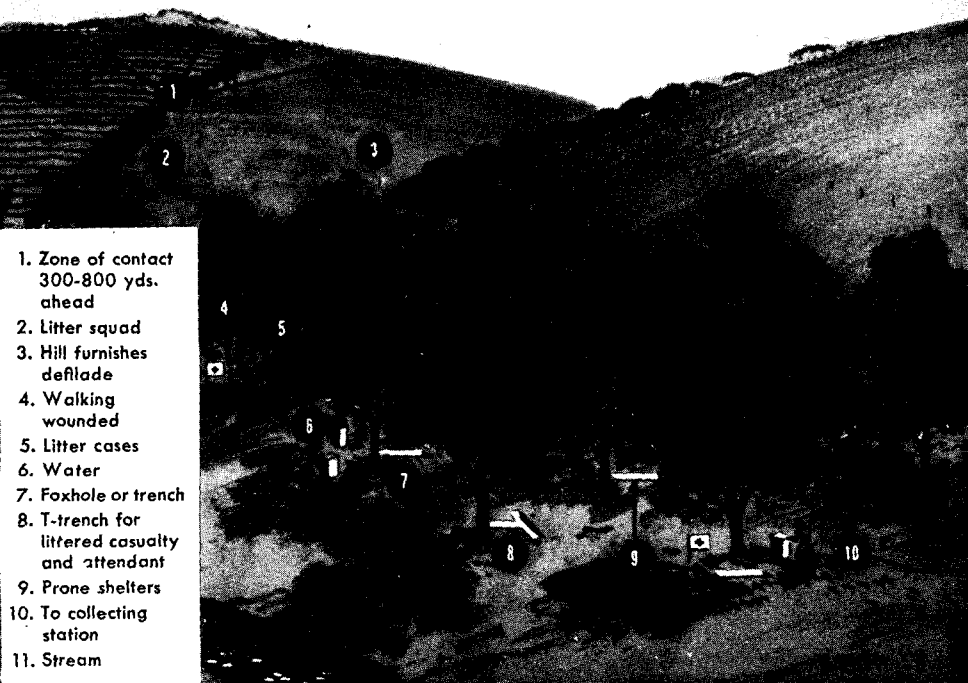
Preliminary examination and treatment should be conducted, if possible, in a building, cave, or some shelter where necessary artificial light can be concealed from outside view.

Lanterns in special blackout boxes (fig. 81) help maintain blackout conditions. When the position will be occupied for some time, part of the station may be dug in the side of a hill, with access provided through concealed shafts or tunnels.

Galvanized metal supply chests, pails, and other shiny objects (fig. 82) should be toned down with standard ordnance OD vehicle paint or phenolic enamel. These paints will adhere if the brightness of the metal is first dulled with a solution of 5 percent copper sulphate and 95 percent vinegar, which is applied with a dauber, rubbed dry after 5 minutes, and then washed thoroughly in clear water.

Ambulances which evacuate wounded should stop under cover, practice dispersal, and refrain from making unnecessary tracks, such as turn-arounds off existing roads. In day-time, vehicles are normally located in a concealed motor park farther to the rear than the station. Windshield, headlights, and other glass are covered (fig. 83) or dulled with mud to eliminate danger of reflections from bursting shells or flares.

FIGURE 79.—Schematic view of typical battalion aid station. Good siting includes natural concealment, good approaches, and defilade. Camouflage discipline must be rigidly maintained.



1. Zone of contact
300-800 yds.
ahead
2. Litter squad
3. Hill furnishes
defilade
4. Walking
wounded
5. Litter cases
6. Water
7. Foxhole or trench
8. T-trench for
littered casualty
and attendant
9. Prone shelters
10. To collecting
station
11. Stream

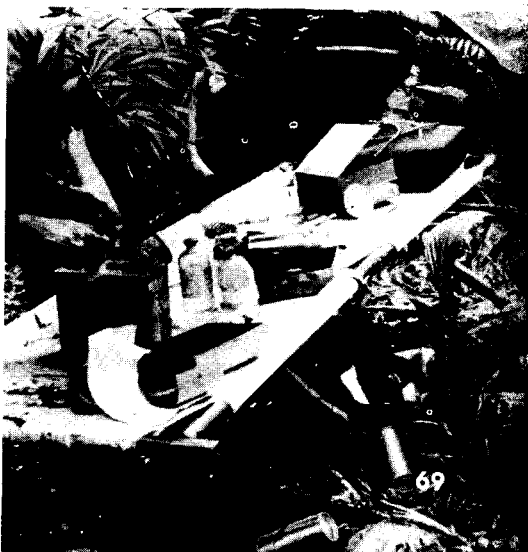
FIGURE 80.—When foxholes and prone shelters are used to protect medical personnel and wounded they should be concealed from view. Use removable covers made of natural materials.



FIGURE 81.—Field-expedient blackout box made of plywood and tin, contains a standard army lantern. It has light openings in side which provide adequate light and may be closed before doors or tent flaps are opened to admit wounded.



FIGURE 82. — Empty blood-plasma bottles, cans, and containers may give away position by reflecting light if carelessly discarded in the open. Such debris should be buried in concealed location.



COLLECTING STATIONS

The medical battalion's collecting station is located as far forward as ambulances can safely operate during daylight hours. It is necessary to have a sheltered place where vehicles can load, unload, and turn. By using existing roads or concealed access routes, movements of vehicles are less likely to attract attention. In addition, the turn-off from the main road, unless it is a normal access route—to a building, for example—must be concealed to prevent it from pointing like an arrow to the collecting station.

Choice of position will be influenced mainly by the availability of natural cover. Existing buildings, when available, provide an ideal location, but they should be utilized without changing their civilian appearance. When it is necessary to add overhead cover to partially destroyed buildings to render them serviceable, debris should be used to blend with the rough and jagged lines of the background.

When the area offers inadequate natural cover, the elements of the collecting station should be dispersed and fitted into the dark features of the terrain pattern.

CLEARING STATIONS

The clearing station (fig. 83) is a sizeable installation farther to the rear than the collecting station. It is where ultimate disposition of the wounded is determined and is best located in a town or village where it can be concealed easily.

Ideal locations for clearing-station units are churches, schools, hospitals, and other large buildings, because means for sewage disposal, water supply, electric current and other facilities usually already exist in such structures. When proper precautions are taken, civilian buildings may be occupied without drawing the suspicion of enemy observers.

Even if the clearing station has to be established farther to the rear than is desirable, it is preferable to have it under permanent cover rather than in tents. Otherwise, the size and number of tents required make concealment extremely difficult. If the use of tents is unavoidable, they should be dispersed under adequate natural concealment, and no more tents should be erected than are absolutely essential for the operation of the station. The hospital ward tent has now been replaced by the M1942 OD squad tent which, with the addition of blankets at the four corners in the interior to cover up the openings at the lacings, is lightproof. When

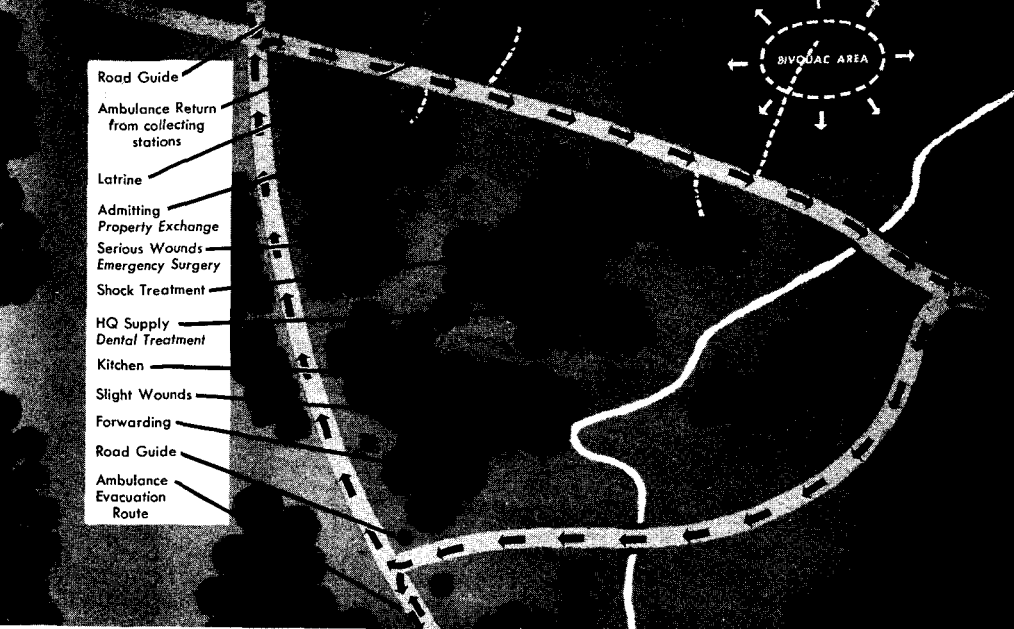


FIGURE 83.—Medical clearing station is located 8 to 12 miles to rear of main line of resistance. When possible, it is housed in buildings of a town. In the country, tents should take advantage of all natural concealment afforded by the terrain. Note ambulance circulation route.

erecting the tent, the canopy should be drawn tightly over the poles and the tent flaps fastened securely to the ground in order to prevent light leaks at the base of the tent.

Old khaki-colored tentage can be toned down by the use of standard quartermaster tentage compound and dye or by field expedients such as soot, charcoal and water, a solution made from old coffee grounds, or other improvised dyes native to or available in the locality.

When tents are placed in a sparsely wooded area, their outlines should be disrupted with cut foliage. Tents placed in debris-littered surroundings may be camouflaged with broken timbers or other debris placed irregularly.

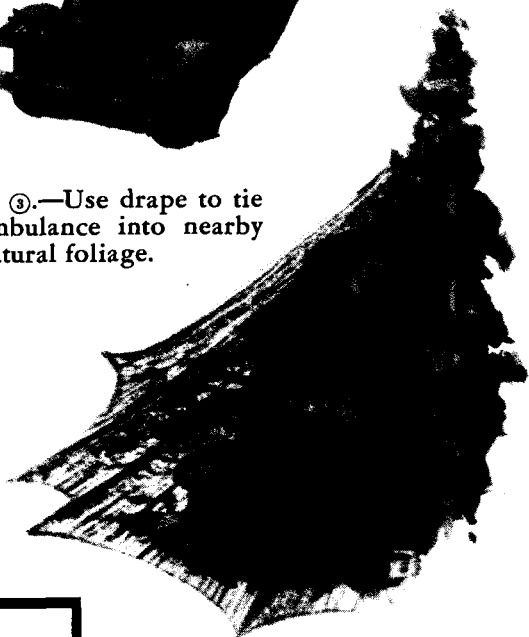
MEDICAL VEHICLES

Where, as at a clearing station, a sizeable number of vehicles must operate in daytime, they should be dispersed at all times. When parked under sparse natural cover or in the open, vehicles should have drapes erected over them to keep them hidden from enemy eyes. The tables of equipment for the collecting and clearing companies of a medical battalion authorize the use of shrimp nets for this purpose.

FIGURE 84 ①.—Toned-down vehicle is conspicuous as long as red cross is visible.



③.—Use drape to tie ambulance into nearby natural foliage.



②.—If concealment of ambulances is ordered by theater commander, the red cross insignia should be covered—not painted out. Vehicle drapes can be used.

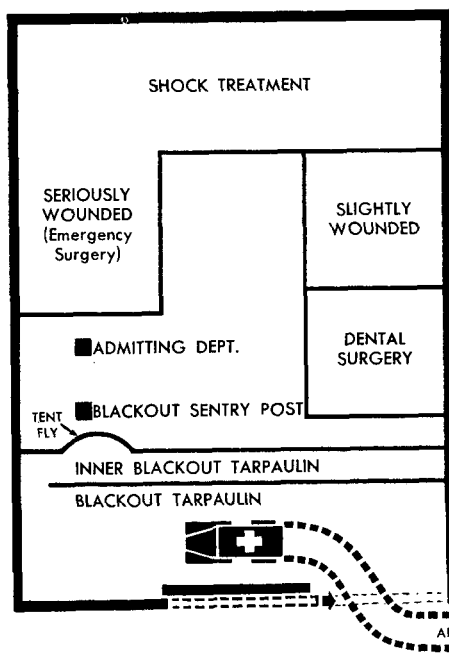


FIGURE 85.—Diagram of blackout system for medical clearing station as laid out in warehouse. Door openings must have effective blackout flaps, since wounded will be brought in and out frequently.

